




**PREVENTION AND TREATMENT  
OF TUBERCULOSIS IN THE  
ADMINISTRATIVE COUNTY OF LANCASTER.**

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**Report of the Central Tuberculosis Officer  
of the Lancashire County Council  
for the Year 1927.**

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# COUNTY TUBERCULOSIS COMMITTEE

(1928).

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The Chairman of the County Council :

†H. Wade Deacon, Esq., C.B.E., J.P.

The Vice-Chairman of the County Council :

†J. T. Travis Clegg, Esq., J.P., D.L.

---

*Chairman of Committee :*

\*†C. J. Trimble, Esq., C.B., C.M.G., L.R.C.S.I., J.P., D.L.

*Vice-Chairman :*

\*E. Boothman, Esq., J.P.

## COUNTY ALDERMEN—

J. C. Beckett, Esq., M.R.C.S., L.R.C.P., D.P.H.	R. Sephton, Esq., M.R.C.S., J.P.
A. S. Bury, Esq., J.P.	*H. Winstanley, Esq., L.R.C.P., L.R.C.S., J.P.
*W. Hodgson, Esq., J.P.	

## COUNTY COUNCILLORS—

J. A. Birch, Esq.	*A. Kenyon, Esq.
G. H. Brown, Esq.	*Rev. A. M. Mitchell, M.A.
*R. Dilworth, Esq.	*G. Scarr, Esq., O.B.E., B.A., M.B., L.R.C.S.I., J.P.
I. Flack, Esq., L.R.C.P., L.R.F.P.S., D.P.H.	C. De Lisle Shortt, Esq., L.M., L.S.
F. H. Hollingworth, Esq.	E. G. Woolgar, Esq.
H. F. Jeffery, Esq., M.B., Ch.B., J.P.	

\* Members of Sanatorium and Hospital Sub-Committee.

† County Aldermen.



## MEDICAL AND NURSING STAFF OF THE TUBERCULOSIS DEPARTMENT, 1928.

G. Lissant Cox, M.A., M.D. (Camb.), M.R.C.S. (Eng.), L.R.C.P. (Lond.),  
Central Tuberculosis Officer.

### DISPENSARY AREAS.

#### *Area No. 1. (Population 255,076).*

(Laneaster, Moreeambe, Lytham St. Annes, Garstang Rural (part),  
Preston Rural, Chorley, and Horwich districts).

Consultant Tuberculosis Officer—Alan D. Brunwin, M.A., M.D., B.Ch.  
(Camb.), D.P.H. (Aberdeen).

Assistant Tuberculosis Officer—George H. Leigh, M.D., Ch.B.,  
D.P.H. (Manch.).

#### *Area No. 2. (Population 355,674).*

(Acerington, Nelson, Baeup, Clitheroe, Darwen, and Rawtenstall  
districts).

Consultant Tuberculosis Officer—Burgess MacPhee, M.B., Ch.B.  
(Glas.), D.P.H. (Camb.).

Assistant Tuberculosis Officers—Scott C. Adam, M.B., Ch.B.  
(Glas.), D.P.H. (Lond.), and F. C. S. Bradbury, M.B., B.Ch.,  
B.A.O. (Belfast).

#### *Area No. 3. (Population 368,383).*

(Ashton-under-Lyne, Mossley, Bury Rural, Chadderton, Crompton,  
Littleborough, and Middleton districts).

Consultant Tuberculosis Officer—J. Logan Stewart, M.A., M.B., Ch.B.  
(Glas.), D.P.H. (Camb.).

Assistant Tuberculosis Officers—George Fletcher, M.A., M.D.  
(Glas.), M.R.C.P. (Lond.), D.P.H. (Camb.), and Cecil Berry,  
L.R.C.P., L.R.C.S. (Edin.), L.F.P.S. (Glas.), D.P.H. (R.C.S.I.).

#### *Area No. 4. (Population 342,606).*

(Leigh, Eccles, Farnworth, Stretford, and Swinton districts).

Consultant Tuberculosis Officer—George Jessel, M.A., M.D. (Oxon.),  
D.P.H. (Manch.).

Assistant Tuberculosis Officers—Alexander B. Jamieson, M.B.,  
Ch.B. (Edin.), and John Cathcart, M.B., Ch.B. (Edin.), D.P.H.  
(R.C.P.S.I.)

#### *Area No. 5. (Population 378,948).*

(Seaforth, West Lancashire Rural, Hindley, Wigan Rural, Newton-in-  
Makerfield, Warrington Rural, Whiston Rural, and Widnes districts).

Consultant Tuberculosis Officer—Charles W. Laird, B.A., M.D. (Dublin),  
D.P.H. (Liverpool).

Assistant Tuberculosis Officers—Charles H. Lilley, M.B., Ch.B.  
(St. Andrews), D.P.H. (Lond.), and G. Barker Charnock, L.R.C.S.,  
L.R.C.P. (Edin.), L.R.F.P.S. (Glas.), D.P.H. (Liverpool).

#### *Furness Sub-Area. (Population 39,328).*

(Dalton-in-Furness, Grange-over-Sands, Ulverston, and Ulverston  
Rural districts).

Consultant Tuberculosis Officer—E. H. Allon Pask, M.D. (Lond.),  
L.R.C.P. (Lond.), M.R.C.S. (Eng.), Medical Superintendent of the  
High Carley Sanatorium.

*Fylde Sub-Area.* (Population 60,285).

(Fleetwood, Fylde Rural, Garstang Rural (part), Kirkham, Preesall, and Thornton districts).

Consultant Tuberculosis Officer—George Leggat, M.B., Ch.B., D.P.H. (Aberdeen), Medical Superintendent of the Elswick Sanatorium.

## SANATORIA AND HOSPITALS.

*High Carley Sanatorium and Oubas House Children's Sanatorium.*

E. H. Allon Pask, M.D. (Lond.), L.R.C.P. (Lond.), M.R.C.S. (Eng.), Medical Superintendent.

Henry J. Villiers, L.R.C.P.I., L.R.C.S.I., Assistant Medical Superintendent.

*Elswick Sanatorium.*

George Leggat, M.B., Ch.B., D.P.H. (Aberdeen), Medical Superintendent.

*Chadderton Pulmonary Hospital.*

James Wood, M.D., M.B., Ch.B., D.P.H., R.C.P.S.I., Visiting Medical Superintendent.

*Peel Hall Pulmonary Hospital.*

George Jessel, M.A., M.D. (Oxon.), D.P.H. (Manch.), Visiting Medical Superintendent.

*Rufford Pulmonary Hospital.*

Charles W. Laird, B.A., M.D. (Dublin), D.P.H. (Liverpool), Visiting Medical Superintendent.

*Withnell Pulmonary Hospital.*

Burgess MacPhee, M.B., Ch.B. (Glas.), D.P.H. (Camb.), Visiting Medical Superintendent.

*Tuberculosis Health Visitors :*

Nurse		Commenced duties	
M. A. Potter		1st June, 1914.	
„ R. Lambert*	„	12th June, 1914.	
„ E. Walch	„	15th June, 1914.	
„ H. Dewsnap*	„	7th December, 1914.	
„ A. Munro*	„	5th July, 1915.	
„ M. Duggan*	„	30th August, 1915.	
„ L. Walker*	„	6th September, 1915.	
„ J. Skelcher	„	26th April, 1916.	
„ A. Tweedy*	„	17th January, 1917.	
„ I. Laing*	„	20th May, 1918.	
„ E. Walters*	„	1st October, 1918.	
„ I. F. Macdonald*	„	2nd October, 1918.	
„ F. D. Abbott*	„	1st July, 1919.	
„ C. Guilfoyle*	„	1st July, 1919.	
„ M. J. Wilson*	„	1st July, 1919.	
„ A. Flynn*	„	1st December, 1919.	
„ M. B. Jones	„	1st December, 1919.	
„ L. F. Norwood	„	5th January, 1920.	
„ E. Watterson	„	19th July, 1920.	
„ E. A. Duston	„	1st February, 1921.	

\* Possesses a health visitor's or sanitary certificate.

*Tuberculosis Health Visitors (contd.)*

Nurse		Commenced duties	
	F. Milnes*		1st March, 1921.
„	H. M. Shakespeare*	„	1st March, 1921.
„	F. G. Smith	„	1st November, 1921.
„	A. Dickinson	„	5th September, 1923.
„	A. Duncan	„	1st April, 1924.
„	H. M. Alcock*	„	20th February, 1925.
„	D. Grime*	„	6th September, 1926.
„	A. Worsley*	„	23rd March, 1927.
„	W. Swift	„	4th April, 1927.
„	M. W. Stringman	„	5th December, 1927.
„	M. Sherwen	„	3rd January, 1928.
„	G. M. Hunter	„	4th June, 1928.
„	L. Farquhar	„	2nd July, 1928.

\* Possesses a health visitor's or sanitary certificate.

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# REPORT

## OF THE

# CENTRAL TUBERCULOSIS OFFICER

### FOR THE YEAR 1927.

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*To the Chairman and Members of the  
Lancashire County Council.*

LADIES AND GENTLEMEN,

I have the honour to submit the thirteenth annual report on the work of the tuberculosis department, and in this introductory portion will give briefly some of the principal features of the work in 1927.

#### *Reduced tuberculosis mortality.*

The death-rate from tuberculosis (all forms) in 1927 was again the lowest recorded in the County. For the pulmonary form of tuberculosis (consumption), the rate was the lowest on record for the fifth successive year.

The County tuberculosis death-rate has invariably been less than for England and Wales. It may be of interest to give the death-rates per 1,000 from tuberculosis in other administrative counties with a population of a million or more: Lancashire, 0·77; Durham, 1·13; Essex, 0·80; Kent, 0·87; Middlesex, 0·88; and West Riding of Yorkshire, 0·86.

The decline in Lancashire has taken place in spite of the serious amount of unemployment in the staple industries. Whether it is possible for the decline to continue in 1928 with the industrial conditions almost unchanged is very doubtful. (See pages 1 to 7).

#### *Incidence of pulmonary tuberculosis.*

The number of new cases of pulmonary tuberculosis known to have occurred (i.e. new sources of infection), has declined from 2,326 in 1919 to 1,848 in 1927—the lowest so far recorded. (See page 52).

#### *Co-operation with sanitary authorities, medical practitioners, and health officials.*

The results of the tuberculosis scheme would be very different if the relations with the medical practitioners in the County, together with the 120 sanitary authorities and their medical officers and sanitary inspectors had not been of the most cordial and satisfactory character. I take this opportunity of acknowledging such co-operation from these sources.



*The dispensary unit.*

The dispensary organisation, with the staff of consultant tuberculosis officers, assistant tuberculosis officers and nurses, has continued to fulfil its indispensable part of the tuberculosis scheme. Here most valuable work is done in regard to prevention of the spread of infection and diagnosis. The relationship between the medical staff and the family doctors is most cordial. Last year 83 per cent. of new cases were referred to the dispensary for an opinion prior to notification.

Any steps which would diminish the efficiency of the dispensary organisation would strike at the foundation of the County scheme and reduce its effectiveness. (See pages 8 to 14).

*Artificial light treatment.*

Very good results have continued to be obtained from the light centres established at the Ashton-under-Lyne, Lancaster and Chorley dispensaries, particularly for two forms of non-pulmonary tuberculosis (*a*) lupus and (*b*) adenitis with abscess formation and skin involvement. As the result of the experimental work at these dispensaries, additional centres have been established at dispensaries in populous areas in the County. Up to October, 1928, altogether ten light centres had been equipped. Artificial light has not yet been found suitable for pulmonary cases, but for selected cases of non-pulmonary tuberculosis it has proved most valuable.

*Research work. New methods of treatment.*

In accordance with the policy adopted by the County Council, the medical staff have done research work in many directions. They have also tried many new methods of treatment, the results of which are dealt with in Chapter VII, on page 47.

*Notification of new cases.*

Notification by practitioners of new cases of tuberculosis continues to be satisfactory, the statutory Regulations being carried out much better in this County than in many other parts of England and Wales. Instances of failure for some reason or other to notify cases are becoming much less frequent, and in 1927 all but 4·8 per cent. of the deaths from pulmonary tuberculosis had been reported during life-time. This percentage is the lowest so far experienced in the County.

*Visit of Sir George Newman.*

On the 27th November, 1927, we were honoured by a visit to High Carley Sanatorium of Sir George Newman, Chief Medical Officer of the Ministry of Health, who made an inspection of the institution accompanied by the Chairman, Colonel C. J. Trimble, C.B.

*Cost of the County scheme.*

The cost of the tuberculosis scheme of the County Council for 1928-29 has, after allowing for government grants, required a County Rate of 1·66 pence (or 1 $\frac{2}{3}$ d.) in the £.

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I have again to thank my medical colleagues, the nursing staff and clerical staff for continued help. New methods of diagnosis and treatment, and a higher state of efficiency always aimed at, increases the work year by year. I have had very valuable help from my principal clerk, Mr. H. F. Hughes, especially in preparing this report, and have in addition to thank the Public Health Department for furnishing certain statistics on notifications and deaths.

I am,

Your obedient Servant,

G. LISSANT COX,

County Offices, Preston.

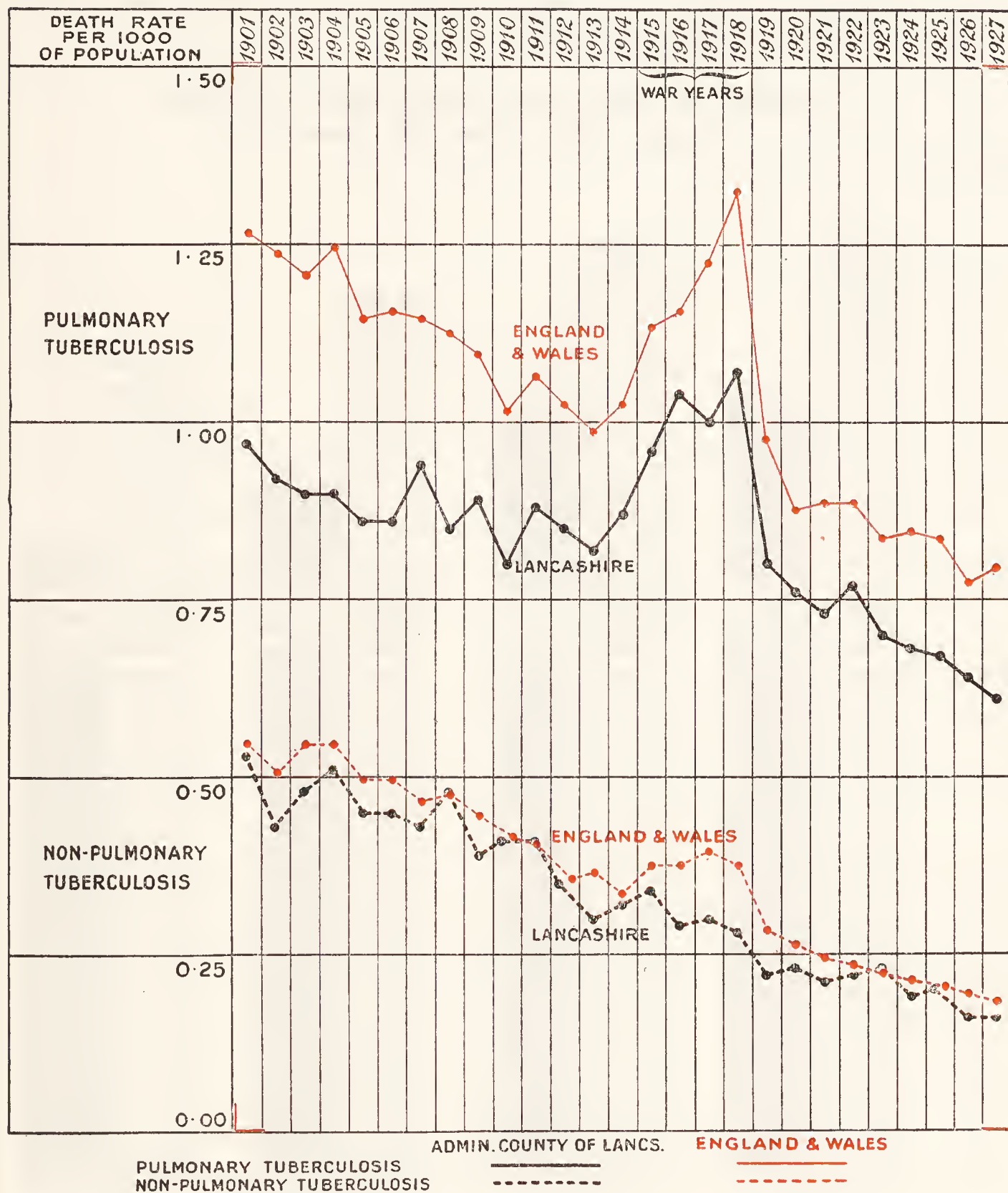
Central Tuberculosis Officer.

12th October, 1928.

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# I.—THE REDUCTION IN MORTALITY FROM TUBERCULOSIS.

The chart below shows the tuberculosis mortality rates for the Administrative County of Lancaster (population  $1\frac{3}{4}$  millions) and for England and Wales :—



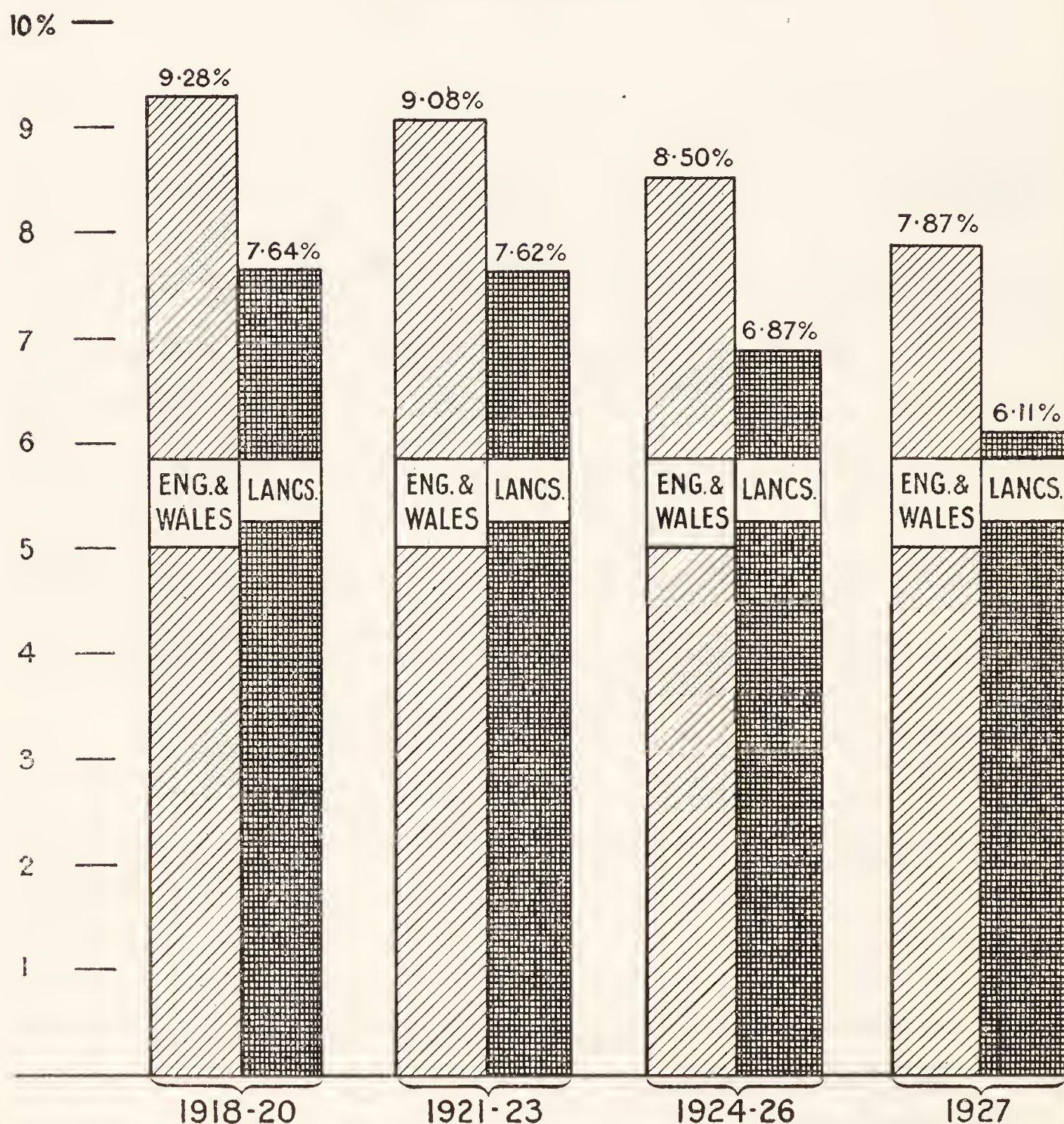
The chart shows :

- The County death-rate from pulmonary tuberculosis has declined progressively during the past five years, the rate for 1927 (0.61 per 1,000) being the lowest on record. During the ten years before the war there was little or no decline ;
- The County pulmonary death-rate has always been below that for England and Wales ;
- The County non-pulmonary death-rate is, on the whole, below that for England and Wales.



The general death-rate of the County from all diseases is, on the whole, also declining, but the fall in the tuberculosis death-rate is more accelerated. In the following diagram the deaths from tuberculosis are expressed as a percentage of the deaths from all causes in the period 1918 to 1927 for England and Wales and for the County. For example; in 1927 the County deaths were: tuberculosis 1401, all causes 22916; percentage 6.11.

*Percentage of deaths from Tuberculosis (all forms)  
to total deaths from All Causes.*



The diagram shows: (a) That the deaths from tuberculosis are declining proportionately more rapidly than the deaths from all causes. (b) Of the deaths from all causes the proportion due to tuberculosis is invariably less in the Administrative County of Lancaster than in England and Wales.

At what age-period and for which sex has the decline in the tuberculosis mortality taken place?



First as regards *pulmonary* tuberculosis, the greatest improvement has taken place in the deaths of males between ages 35 to 45, and of females between ages 35 to 45 and 45 to 55, as will be seen from the following table :—

TABLE 1.

Year.	Estimated Sex Population of Admin. County.	Pulmonary deaths in various age-groups. Years.								Death rate per 1,000 of Sex Popn.
		0 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and over	Total Deaths	
MALES—										
1921 ...	829,438	20	104	132	170	141	95	20	682	0·82
1922 ...	838,837	32	129	131	164	168	99	31	754	0·89
1923 ...	841,987	18	135	146	147	149	74	35	704	0·83
1924 ...	846,804	30	113	121	137	145	77	20	643	0·75
1925 ...	848,086	23	117	127	139	161	69	24	660	0·77
1926 ...	849,512	15	112	130	151	131	81	23	643	0·75
1927 ...	855,117	15	101	114	138	125	70	25	588	0·68
Average .	844,254	21	115	128	149	145	80	25	667	0·79
FEMALES—										
1921 ...	916,800	39	156	173	125	73	37	16	619	0·67
1922 ...	927,190	33	189	150	98	72	40	26	608	0·65
1923 ...	930,671	41	165	139	95	55	36	15	546	0·58
1924 ...	935,996	35	187	134	96	73	32	15	572	0·61
1925 ...	937,414	26	162	129	104	71	39	14	545	0·58
1926 ...	938,988	27	174	131	83	49	36	15	515	0·54
1927 ...	945,183	28	152	145	85	46	45	16	517	0·54
Average .	933,177	32	169	143	98	62	37	16	560	0·60

The last column of the table illustrates the fact that the female pulmonary death-rate is much less than the male. The decline in the County death-rate in 1927 on 1926 is due entirely to a less number of deaths among the males. Further, in striking contrast to the males, the female deaths decline after age 25 at the

time when most women cease wage-earning and enter, on marriage, into household duties.

Second, in regard to *non-pulmonary* tuberculosis, the table below shows the deaths of male and female children and adults in several age-groups together with the death-rates for each sex at all ages :—

TABLE 2.

Average for three years, or Year.	Deaths in Administrative County from Non-Pulmonary Tuberculosis.							Non-pul- monary death- rate per 1,000 of Sex Popn.
	0-5	5-15	15-25	25-45	45-65	65 & over	Total Deaths	
MALES—								
1911-13 ...	164	59	24	33	25	3	309	0·36
1914-16 ...	136	62	29	28	24	3	284	*
1917-19 ...	72	55	30	27	19	2	207	*
1920-22 ...	74	45	30	30	20	5	205	0·24
1923-25 ...	73	38	34	27	23	5	201	0·23
1926 ...	42	35	26	28	18	2	151	0·17
1927 ...	52	31	24	20	15	5	147	0·17
FEMALES—								
1911-13 ...	142	59	38	31	23	5	299	0·32
1914-16 ...	112	48	32	32	16	4	246	*
1917-19 ...	74	42	32	36	18	6	212	*
1920-22 ...	55	41	30	30	17	7	181	0·19
1923-25 ...	49	39	31	26	17	6	169	0·18
1926 ...	47	19	20	31	11	7	135	0·14
1927 ...	43	23	23	36	18	6	149	0·15

\* Death-rates not calculated owing to the difficulty of accurately estimating the sex population during the war years.

It will be seen from the table that the decline since 1911 in the deaths from this form of tuberculosis has occurred chiefly among children in the age-group 0-5 years, followed by the group 5-15. Again, as in pulmonary tuberculosis, the non-pulmonary death-rate is greater among males than females.



*Reasons for the Decline.*

We have seen that there has been a continued decline since 1922 in the deaths from pulmonary tuberculosis. The death-rate in 1927 was for the fifth *successive* year the lowest on record in the County; it was 3 per cent. less than 1926. By contrast, the pulmonary death-rate in England and Wales in 1927 showed an increase of  $2\frac{1}{2}$  per cent. over 1926. For non-pulmonary tuberculosis, the record low County rate for 1926 has been equalled in 1927.

The question naturally presents itself: What is the decline in the County due to and will it be maintained? The answer is difficult. It is generally agreed that there are several factors at work, such as a better knowledge of hygiene and a better educated people. There are the special measures dealing with tuberculosis, and the section of the public health service which devotes itself to the prevention of the disease by the supervision of the patients' home conditions, the education of patients in hygiene, and the isolation in hospitals of infectious persons with unsatisfactory home conditions.

Another step of far-reaching importance is the destruction—even if only partial at the present time—of cows with active tuberculosis.

But, on the other hand, there are certain unfavourable factors at work, particularly two: unemployment and overcrowding. With unemployment so severe it is remarkable that there has been in this County in the last five years a progressive decline in the death-rate from tuberculosis. These five years include 1927 when the general death-rate from all causes in Lancashire rose six per cent. above 1926.

The depression in the cotton, coal and engineering trades is severe in Lancashire. It has already lasted five years, and in spite of recent social measures there is now great hardship for many people. If the depression in trade continues there will probably be a small increase in the number of cases, and a rise in the death-rate from tuberculosis. On the other hand, more satisfactory industrial conditions would certainly assist the public health measures in force, and the amount of tuberculosis would decline.

## CASES AND DEATHS.

I append Table 3 showing the actual number of cases notified and the deaths registered during the fifteen years 1913 to 1927 in the Administrative County.

TABLE 3.

Year.	Cases Notified.			Deaths.			Death-rate per 1,000 of population.		
	Pulmonary Tuberculosis	Non-Pulmonary Tuberculosis	Total.	Pulmonary Tuberculosis	Non-Pulmonary Tuberculosis	Total.	Pulmonary Tuberculosis	Non-Pulmonary Tuberculosis	Tuberculosis (all forms)
1913	2,700	1,592	4,292	1,441	527	1,968	0·82	0·30	1·12
1914	2,820	1,140	3,960	1,523	572	2,095	0·87	0·32	1·19
1915	2,872	1,128	4,000	1,614	555	2,169	0·96	0·34	1·30
1916	2,689	1,180	3,869	1,685	471	2,156	1·04	0·29	1·33
1917	2,375	1,062	3,437	1,584	466	2,050	1·00	0·30	1·30
1918	2,534	885	3,419	1,652	435	2,087	1·07	0·28	1·35
1919	2,105	847	2,952	1,339	358	1,697	0·80	0·22	1·02
1920	2,084	968	3,052	1,323	396	1,719	0·76	0·23	0·99
1921	2,044	899	2,943	1,301	376	1,677	0·73	0·21	0·95
1922	1,863	956	2,819*	1,362	389	1,751	0·77	0·22	0·99
1923	1,937	1,188	3,125*	1,250	412	1,662	0·70	0·23	0·93
1924	1,972	1,120	3,092*	1,215	339	1,554	0·68	0·19	0·87
1925	1,846	1,027	2,873*	1,205	361	1,566	0·67	0·20	0·87
1926	1,828	953	2,781*	1,158	286	1,444	0·64	0·16	0·80
1927	1,794	1,045	2,839*	1,105	296	1,401	0·61	0·16	0·77

\* Corrected figure after deducting the following cases found to be non-tuberculous and notifications cancelled:—1922: 14 pulmonary, 12 non-pulmonary; 1923: 33 pulmonary, 31 non-pulmonary; 1924: 57 pulmonary, 38 non-pulmonary; 1925: 83 pulmonary, 49 non-pulmonary; 1926: 61 pulmonary, 41 non-pulmonary; and 1927: 68 pulmonary, 51 non-pulmonary.

N.B.—The notifications in 1924 cover a period of 53 weeks, and in 1913, 48 weeks.

In 1927 there were 34 fewer cases of pulmonary tuberculosis notified than in 1926; on the other hand 92 more cases of non-pulmonary tuberculosis were notified than in 1926. These additional cases occurred chiefly among children with tuberculous peripheral glands and abdominal tuberculosis. The extension of artificial light treatment at the tuberculosis dispensaries has encouraged doctors to notify non-pulmonary cases at an earlier stage, so that they may receive light treatment.



In Appendix I. are given the deaths and death-rates from pulmonary and non-pulmonary tuberculosis in 120 urban and rural sanitary districts in the Administrative County, and in the several dispensary areas.

The notifications of tuberculosis in 1927 are dealt with further in Appendix II, where folding Tables B, C, and D, are inserted, analysing them as regards the parts of the body affected, age, and sex.

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## II. THE PRINCIPLES UNDERLYING A SCHEME OF ANTI-TUBERCULOSIS MEASURES IN ANY COUNTRY.\*

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The principles which should govern anti-tuberculosis measures in any country are very simple to state; they are difficult to carry out in a high degree of efficiency. Reduced to their smallest terms they are, first, the application of preventive public health or social measures against this infective disease; and second, the accurate diagnosis and treatment of the individual patient. These are trite observations—almost platitudes—but they bring out, nevertheless, at once the important fact, often forgotten by those of limited experience, that we have to drive not one but two horses, and if we wish to advance in our attack they must be driven tandem and, most important of all, the leading horse should always be the one named PREVENTION.

To come then to more definite terms, how should we apply preventive measures, social, environmental, or public health, and accurate diagnosis and treatment of the individual? I propose for simplicity not to deal with the pros and cons of the biological, nutritional, or environmental factors, but to concentrate on anti-tuberculosis measures which can be under the control of the tuberculosis service. These measures may be discussed under three headings :—

- I.—The Dispensary Unit, including notification of cases.
- II.—The Institutional Unit (hospital, sanatorium, or settlement).
- III.—After-care and education of the people.

### I. THE DISPENSARY UNIT, INCLUDING NOTIFICATION.

I do not need to detail what we understand by the tuberculosis dispensary, but it cannot be over-emphasised that it is an organisation and not a building, and that the commanding officer—the tuberculosis officer—is the most important unit or part of the whole organisation. This is so often overlooked or forgotten, but is of vital importance if we wish to have in this or any country really efficient measures for prevention and also accurate diagnosis and specialist treatment. The tuberculosis dispensary is the conning tower of the battleship, and the tuberculosis officer is the C.O. If he is incompetent, because badly

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\* This chapter formed the basis of an address by Dr. G. Lissant Cox at the annual conference of the National Association for the Prevention of Tuberculosis at London on the 16th October, 1928.

paid ; if his local authority does not provide him, as is often the case, with adequate means to be a real up-to-date specialist ; if the local authority is so small in size, and will not combine with other small areas, that a real specialist cannot be employed ; then the money—in this country public money—spent on the tuberculosis officer's upkeep and the local scheme dealing with tuberculosis is mostly wasted.

Should the tuberculosis officer be a whole-time tuberculosis specialist or not ? The Departmental Committee's Report, usually called the Astor Report, on which the campaign against tuberculosis is supposed to be modelled, is clear and definite on this point. The tuberculosis officer was to be in all cases a whole-time appointment, at a *pre-war* salary of £400 to £500.

What is the position to-day ? The recommendations of the Astor Report have not been carried out in a great many instances. There are nearly as many part-time tuberculosis workers as whole-time (about 177 part-time to 190 whole-time) and few tuberculosis officers receive a salary equivalent to £500 pre-war. Why has this occurred ? There are two reasons. The first is that many do not believe in whole-time work for tuberculosis—they say it is too expensive or too dull. Second, the large number of very small county and county borough authorities in Great Britain makes it impossible, without combination of small districts with perhaps only 50,000 of a population, to have whole-time specialists.

Then there is at the present time a strong movement to hand over the dispensary unit in county areas to the local sanitary authorities, i.e., the urban and rural district councils. The whole time medical officer of health will then be the tuberculosis officer.

If this be applied to the most highly organised and efficient counties, like Derbyshire or Cambridgeshire, there is bound to be a definite lowering of the standard of tuberculosis work. Other public health work may be improved—where there are at present only part-time medical officers of health it will certainly be improved—but tuberculosis work cannot be carried out at the high level of the counties I have named. There is a further very serious objection if the tuberculosis work is split up amongst a lot of medical officers of health of sanitary districts whose population is relatively small, there is brought about a divorce between the dispensary side and the institutional side of the work. I hope to show later how important it is for the tuberculosis officer to have hospital beds at his disposal—and how this can be carried out.



The appointment of two consultant tuberculosis officers, one for non-pulmonary and one for pulmonary, for a part or the whole county area to deal with difficult cases is held by some to get over the disadvantage of medical officers of health being also tuberculosis officers. That such posts will give a few favoured tuberculosis officers a larger income than they enjoy at present is true and attractive to the individual. But as a method to produce the most efficient dispensary organisation we merely are out of the frying-pan into the fire. We have three doctors, instead of *two*, dealing with one patient; the family doctor, the omnibus medical officer of health, and the consultant. But the consultant tuberculosis officer is now at the mercy of the personal ideas of the numerous medical officers of health as to the cases he may see, and so the average patient, who is also a ratepayer, does not obtain specialist advice in pulmonary tuberculosis as a routine measure.

The dispensary area—what should it be? Here again, except in the larger county boroughs like Birmingham, Sheffield and Bradford, and a few counties all with a high standard of anti-tuberculosis work, the recommendations in the Astor report have not been carried out. In that report Dr. Lyster of Hampshire showed clearly that the dispensary area should contain not less than 250,000 of a population.

*Notification of Cases.* I have coupled the tuberculosis dispensary with notification. Compulsory notification is generally held to be necessary in any complete scheme dealing with the prevention and treatment of tuberculosis. It is considered to be the best means of putting the public health and dispensary organisation in touch with the cases of tuberculosis. First find your cases, then deal with them and their causes.

Notification, however, is in practice by no means so perfect as it should be. We would like through notification to get not only *all* the cases, but the cases in the *early* stage of the disease. We do not do this, and why? It is usual, here, to put all the blame on the family doctors, but this is quite wrong. In Lancashire, where we have tried to produce an efficient dispensary organisation, 83 per cent. of all cases come to the consultant tuberculosis officer before notification for an opinion as to the diagnosis. This is good co-operation with the family doctor, but in spite of it we do not get either all the cases or the cases early enough.

*A Framingham Experiment in England.* How are we to improve matters? There are two ways. It is not known how many missed cases there are in England in any area. What we require is a Framingham experiment in England. This experiment, as most of you



know, was a special systematic search house by house for cases of tuberculosis in a small town in America. With the co-operation of the family doctors a complete survey was made of the population of the town and remarkable results were the consequence. Other local areas in the United States have had similar results by a similar procedure.

Now that the National Association for the Prevention of Tuberculosis has so large a sum in its bank balance, I would urge the Council of that body to consider the undertaking of such a piece of research in this country. No more valuable research in tuberculosis could be made, and it is very urgently needed.

*Periodic Health Examinations.* But how shall we obtain our cases in the early stages of the disease. Although we have had in Lancashire for the years after the war an expert consultative staff, we still get too many cases in the late stages of the disease. This, as I have just said, is not chiefly the fault of the family doctor. The cure for this state of affairs is the gradual education of the people by the better teaching of hygiene in schools and elsewhere. This, however, is a slow process. But a method does exist whereby we could obtain our cases early. It is by periodic health examinations of the whole population. Owing to the nature of the disease, the greater number of very early cases will always go undiscovered until we have periodic health examinations.

*Summary.* To sum up then as regards the dispensary unit. To perform its work most efficiently it must operate over a big enough area to provide suitable conditions for a whole-time specialist. Best of all is where there can be a graded service. We have tried various sizes in Lancashire and find for urban areas a population of 350,000, or for mostly rural areas a population of 250,000 make suitable dispensary areas. These can be efficiently staffed by one consultant tuberculosis officer and two assistant tuberculosis officers. *Without these large areas we could not reach the standard of work which we have reached.* It is of the greatest importance that the dispensary tuberculosis officer should have beds at his disposal like any consulting physician or surgeon. We have arranged this for four out of five of our dispensary areas. Sparsely populated rural areas can be linked to sanatoria—for it is very desirable that the medical superintendent of these institutions should not become isolated and one-sided, but should have some dispensary work as well. The medical superintendent then in our County becomes the consultant tuberculosis officer for a small rural dispensary area round the sanatorium. I commend this for the consideration of those who come from rural areas,

## II.—THE INSTITUTIONAL UNIT (HOSPITAL, SANATORIUM OR SETTLEMENT).

*Accommodation required.* It is, I think, generally accepted that hospital or sanatorium beds are required in any complete tuberculosis scheme. The Astor Report laid down one sanatorium bed per 5,000 of the population for so-called "early" cases, and one hospital bed for so-called "advanced" cases. It is interesting to note that after fifteen years' experience in Lancashire we have found that these figures are substantially correct for the number of patients we have at present. Beds for children are additional to these figures, and we have found that one per 24,000 population for pulmonary and one per 10,000 population for non-pulmonary are required for children. The latter figure for non-pulmonary beds is subject to a proportion of cases being treated by artificial light at the dispensaries.

*The Settlement.* With regard to the tuberculosis settlement, this, as is well known, has as yet only been tried thoroughly at three places, Papworth, Preston Hall, and Barrowmore Hall in Cheshire. When we listen to the enthusiastic advocates of the tuberculosis settlement we are almost persuaded that it is a panacea for the successful solution of the tuberculosis problem. But the facts are that the three settlements have been and still are under private management and the methods of public finance do not make it probable that similar concerns could be run successfully under public management. Second, these settlements are only able so far to settle 25 per cent. or less of the total number of patients who go there for treatment, ~~that is to say 75 per cent. of all cases are unsuitable for settlement life as devised at present.~~ Third, no country can absorb more than a certain amount of the specialised goods manufactured by a settlement, so that to multiply settlements making similar articles would surely produce a saturation point above which the articles manufactured could not be sold at a profit.

*Institutional treatment.* To return, then, to the tuberculosis hospital and sanatorium. More criticism is directed at the present time to the sanatorium or institution side of tuberculosis work than to the dispensary side, and it is necessary to take this criticism into account when considering the best scheme for anti-tuberculosis measures in any country. It is stated that the sanatorium permanently cures few of the patients sent to the institution. This is quite true if the sanatorium only receives intermediate and advanced cases, but at the same time it does not mean that the principle of sanatorium treatment is unsound. It is, in my view, essential that there should be adequate accommodation in any scheme for the isolation and proper nursing of advanced cases of consumption. In far too many schemes



there is not nearly sufficient accommodation for such cases. It is comparatively easy to deal with them from an urban authority, but in large scattered rural areas it is much more difficult. One should not have, on the one hand, a large number of such patients in any one institution, nor is it advisable to have patients taken long distances from their homes. We have tried to solve the problem in Lancashire by arranging for a tuberculosis hospital in each dispensary area, run by the consultant tuberculosis officer and his assistants. This provides for cheap administration and for the advanced cases being isolated near to their homes. It enables the superintendent cum tuberculosis officer to be fully acquainted with the home conditions of his patients, and it also provides him with beds for his own cases at a hospital under his own care. I commend this arrangement for careful consideration for any complete tuberculosis scheme.

*Relation of dispensary and institutional units.* Before leaving the hospital or sanatorium or institutional unit one general point which I consider very important may be mentioned here: it is the relation between the main units of a tuberculosis scheme. Should the dispensary unit and the institutional unit be closely related or divorced from one another? In many schemes they are quite unrelated.

Suppose we take the example of London. Here the dispensary units are under the control of the different municipal boroughs. If a patient, in the opinion of the tuberculosis officer of the dispensary unit, requires institutional treatment, or isolation for bad home conditions, the recommendation has to go to a different authority, to wit, the London County Council, and the patients are judged, mainly if not entirely, on the paper reports of the tuberculosis officer of the municipal boroughs. If institutional treatment is considered desirable by the officer of the London County Council, the patient is then sent to an institution—a sanatorium or hospital—under an entirely different authority, namely, the Metropolitan Asylums Board. It is clear, then, that the dispensary or public health side of tuberculosis work in London is divorced from the institutional side, and I suggest that it is this divorce which is the fundamental cause of the dissatisfaction which exists with regard to the institutional side of tuberculosis work in London.

*Size of Sanatoria and Hospitals.* The success or failure of institutions depends a great deal on their size. It is easy to have sanatoria or hospitals for pulmonary cases too large. It is a fact, though hardly to be expected, that very large institutions of 300 beds are not cheaper to run than small ones of 50 to 100. No sanatoria (for early cases) ought to be above 150 beds. There are, for example, hospitals for advanced and chronic cases in London that accommodate over 300 patients.



These are, in my opinion, far too large. The medical superintendent cannot know all his patients, he becomes immersed in administrative routine, and the patients, chronic and advanced cases—are being treated and isolated too far from their homes to remain in the hospital for long periods as they should.

*Summary.* To sum up, then, the institutional side. First, and most important, let the tuberculosis officer be also in charge of a small hospital or of beds, and the medical superintendent of the larger institutions in charge of a small dispensary area. In this way there is no divorce between the dispensary and institutional side of tuberculosis work. Keep the sanatoria small; not above 150 beds. Taking as a basis the amount of tuberculosis known at present in my own county, there should be a minimum for pulmonary tuberculosis of one adult sanatorium bed to 5,000 of the population, and one adult hospital bed to 6,000 of the population. Beds for children are additional, one per 24,000 for pulmonary and one per 10,000 for non-pulmonary.

### III.—AFTER-CARE AND EDUCATION OF THE PEOPLE.

All tuberculosis schemes require after-care measures, and every efficient scheme educates the people. After-care committees are very valuable. We have 19 in Lancashire. There is no need to recommend to this audience education in hygiene and ways of life; it is perhaps the only non-controversial part of the anti-tuberculosis campaign. Some consider the biological factor, some the nutritional, others the environmental factor to be the only one that matters in an anti-tuberculosis campaign. This surely is too narrow a view.

### CONCLUSION.

Finally, let not the tuberculosis service be faint-hearted. Do not get side-tracked and run after every newly advertised panacea. Look at the splendid results in Sheffield and in Birmingham where tuberculosis schemes exist under men of real ability. It is there that the death-rate from tuberculosis has diminished by one-half and one-third in the last ten years.

If you will give the tuberculosis service the means, this terrible scourge can be and will be conquered.

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### III.—THE PREVENTION AND TREATMENT OF TUBERCULOSIS, AND THE TUBERCULOSIS DISPENSARY ORGANISATION.

The preceding chapter has dealt with the principles underlying a scheme of anti-tuberculosis measures. As a corollary, I have asked Dr. G. Jessel, consultant tuberculosis officer for one of the large dispensary areas, to give a first-hand account of the dispensary work, and what follows in this chapter has been written by him.

The intensive campaign, which is being conducted under the auspices of the councils of counties and county boroughs, is based on the Report of the Departmental Committee on Tuberculosis, published in 1912. The basis of the scheme recommended by the Committee consisted of two units (1) the tuberculosis dispensary, which is the subject of the present survey, (2) sanatoria and hospitals.

The Departmental Committee was of opinion that "the tuberculosis dispensary should be the common centre for the diagnosis and for the organisation of treatment of tuberculosis in each area" and that "the one essential is a skilled tuberculosis officer with capacity for organisation." The functions of the dispensary were outlined by the Committee as follows :—

- (1) Receiving house and centre of diagnosis.
- (2) Clearing house and centre for observation.
- (3) Centre of curative treatment.
- (4) Centre for the examination of contacts.
- (5) Centre for "after-care."
- (6) Information bureau and educational centre.

Having regard to the foregoing, a review of dispensary work and organisation in the Administrative County in the light of fifteen years' experience may be regarded as opportune, and such an examination reveals the fact that, while discharging its fundamental obligations, the scope of dispensary activities has widened considerably in many directions.

The essential functions of a modern dispensary may be briefly outlined as follows :—

- (1) The diagnosis of persons suffering from tuberculosis in as early a stage as possible.
- (2) The provision of special forms of treatment (*a*) by recommendation to suitable institutions, (*b*) actual dispensary treatment, and (*c*) home supervision of and assistance to patients receiving symptomatic treatment from their own medical practitioners.
- (3) The prevention of tuberculosis, both in relation to known infectious cases and the enlightenment of the public generally.



*Diagnosis.*—The majority of new persons examined by tuberculosis officers are referred by medical practitioners as suspected cases ; no less than 83·4 per cent, of new cases (excluding contacts) having been so referred in 1927. The remainder were examined after receipt of particulars of the notification of the case by the patient's doctor to the local medical officer of health.

In the diagnosis of cases all modern methods are fully utilised : a careful history is taken, one or more clinical examinations of the patient made, temperature and weight records are obtained, sputum examinations carried out, and an X-ray examination made at the dispensary by the tuberculosis officer. The systematic use of X-rays, which has been made in the County dispensaries for several years past, has provided an additional avenue towards accurate diagnosis, which has proved of very great value, and the labour and expense involved in the regular taking of skiagrams has been amply justified by the advantages derived therefrom.

Accurate diagnosis depends upon the careful appraisalment of all the available evidence, and by the utilisation of the above methods it has usually been possible to make a firm diagnosis within two or three weeks. At the end of 1927 only 63 cases remained undiagnosed at the twenty-four County dispensaries. Occasionally, cases present special difficulties and these are admitted into observation beds at one of the County institutions.

Particulars of all notifications and of all deaths from tuberculosis are received weekly at the dispensaries. A search amongst the dispensary records is then made to see whether the case had at any time been examined by the tuberculosis officer, and a systematic enquiry over many years has only on rare occasions provided evidence of mistaken diagnosis owing to the thoroughness with which doubtful cases are investigated. The investigations, regularly made with respect to each patient at the various tuberculosis institutions, show, moreover, that there is no tendency towards over-diagnosis of tuberculosis. In all cases sent for diagnosis or examined after notification, the tuberculosis officer communicates with the patient's doctor, when the latter is not present at the examination, and where the patient is suffering from tuberculosis an exchange of views is maintained at regular intervals. The majority of new patients attend at the dispensaries for examination, but an appreciable number are unfit to attend and have to be visited at their homes. In such cases arrangements are made, if possible, for a personal consultation with the patient's doctor, and these consultations have proved of the greatest value. In one dispensary area last year the patient's doctor was present in 74 per cent. of the examinations of new cases at home.

*Treatment.*—(a) Patients likely to derive benefit from institutional treatment are encouraged to avail themselves of the excellent facilities



provided. These include beds for pulmonary, non-pulmonary and combined cases, classified according to the stage of the disease and the requirements of the patients. The numerous chronic and advanced pulmonary cases present a difficult problem, especially having regard to the infectious nature of their illness and the frequent impossibility of providing satisfactory and safe nursing facilities in the patients' homes. These patients or their friends are, moreover, often averse to a prolonged stay in any institution especially when far away. A very satisfactory solution to the difficult problem has been found in Lancashire by the provision in each dispensary area of a pulmonary hospital for chronic, advanced and observation cases under the charge in four instances, of the consultant tuberculosis officer of the area. The latter is thus in a position comparable to the private consultant physician, who has hospital beds at his disposal, whereby he can follow closely the results of the latest methods of treatment by clinical and X-ray study of each case. The patients benefit because there is continuity of specialist treatment and supervision before, during, and after their sojourn in a pulmonary hospital. These hospitals, being within reasonable proximity to patients' homes and being well equipped, both from the medical and recreative standpoints, are able to retain patients voluntarily for long periods. A large number of patients are, however, perforce treated in non-County institutions, often at some distance from their homes. It has been found that the disadvantages inherent in such necessary arrangements have been greatly reduced by the regular visits to such institutions of the consultant tuberculosis officers, who are familiar with the patients' home circumstances. Useful opportunities are thus afforded for personal consultation with the medical officers of the various institutions. The medical aspects of the cases and the problems arising in their domestic circumstances receive careful consideration, while any difficulties which may have arisen are usually straightened out at such visits.

(b) Routine medical treatment, such as is available at the hands of private practitioners, is not provided at the dispensaries. There are, however, many forms of specialist treatment, which the tuberculosis officers are frequently called upon to undertake. These include refills for artificial pneumothorax in pulmonary cases, aspiration of abscesses, application of plaster, splints, or extension apparatus for tuberculous joints, local treatment of skin cases, etc. A recent advance in special dispensary treatment is the provision in each dispensary area of one or more centres for artificial light therapy, and already many striking successes have been obtained. (See chapter IV.)

(c) The assistance given to medical practitioners with respect to patients under home treatment, though less spectacular in character, is, however, of the greatest value, as the prolonged nature of the illness tries the faith and patience of most sufferers. The regular examina-

tions by the tuberculosis officers and the home visits by the trained dispensary nurses are an essential part of the scheme. By this means, changes in the patients' condition are noted and in consultation with their doctors variations in treatment can be instituted. In addition patients are encouraged to persevere with what often appears to them a long and tedious routine, e.g., regularly to record their temperatures and to remain in bed when feverish; to sleep alone; to make safe disposal of their sputum, etc. Actual nursing and dressings are also part of the routine of the dispensary nurses. To enable all this to be properly carried out, the tuberculosis officers have at their disposal a stock of bedsteads, mattresses and nursing requisites e.g., bed-pans, thermometers, paper handkerchiefs and bags, splints, spinal carriages, etc., while through the care organisations they are able to secure for necessitous cases suitable eleemosynary assistance, as is described fully in this and previous reports. Due consideration is given to each patient, not only as to his medical condition and requirements, but also to his financial and domestic circumstances and his ability to take advantage of the facilities available for treatment under the County scheme. Necessitous cases are promptly brought to the notice of the appropriate care committee or, where no such committee exists, are assisted directly from funds voted by the County Tuberculosis Committee for the purpose. Care is, of course, taken to keep in close touch with kindred organisations and thereby to avoid overlapping.

*Prevention.*—There is no sharp line of demarcation between treatment and prevention, and as far as lies within their scope and province, the staff of the dispensaries do everything in their power to co-operate with the local medical officers of health. All known cases are regularly visited and assistance in treatment is accompanied by instruction in preventive measures, e.g., safe disposal of sputum, sleeping alone, disinfection of utensils, etc. Treatment and prevention thus go hand in hand and, as has already been mentioned, all necessary articles are available from the dispensaries to enable patients greatly to reduce the risks of infection to other members of the household. In spite of modern housing difficulties, the dispensary nurses are remarkably successful in persuading patients to sleep alone and in assisting in the rearrangement of the available sleeping accommodation. Thus at the end of 1927, out of 1,836 infectious cases 1,217 had separate bedrooms, 470 separate beds while in only 149 cases was a separate bed impossible, and of these latter, 46 were actually in pulmonary hospitals. The existence of pulmonary hospitals, and especially of those in dispensary areas under the direct control of the consultant tuberculosis officers, is of the greatest value in this connection. In one such area the percentage of infectious cases without at least a separate bed and not in institutions, was 2·3.



The known infectious patient may have infected others, whose disease is not yet manifest, and in order to discover early cases the tuberculosis officers examine as many contacts of infectious cases as possible. It is, however, by no means easy to persuade many persons to be examined who feel perfectly well, or who are afraid of the possible result.

Finally, a good deal of useful work is steadily done as regards the education of the public generally in the laws of health and the early symptoms of tuberculosis. The personal contact with thousands of individuals each year gives ample scope for the "word in season." Apart from this, however, lectures and addresses are frequently given by the tuberculosis officers, and have been well attended. The recent introduction in many districts of "Health Weeks" has also provided an opportunity for effective co-operation with the local medical officers of health, who have frequently invited tuberculosis officers to take part by means of special exhibits and (or) a lecture.

It is thus apparent that the responsibilities of the dispensary staff are many and varied. They are brought into intimate relationship with (*a*) the patients and their families, (*b*) the medical practitioners, school medical officers, etc., who provide their clientèle, (*c*) the local medical officers of health, whom they assist in the preventive aspects of the disease, (*d*) social workers, etc. Detailed records of each person examined are made and preserved, and no efforts are spared to keep in effective and systematic touch with all definite cases throughout their illness, often extending over several years.

New doctors commencing or taking over practices in the Administrative County are made acquainted by the tuberculosis officer with the address of the nearest dispensary and the special facilities for treatment of tuberculosis.

In order that the tuberculosis officers and nurses may preserve that freshness of outlook and zest which otherwise might tend to become impaired, the County Tuberculosis Committee have, with customary wisdom and foresight, generously provided opportunities for attendance at short post-graduate courses. The beneficial effects of such post-graduate study in enabling the staff to keep abreast of modern knowledge and discovery, cannot fail to be of the greatest value in the maintenance of a high standard of medical work and an efficient dispensary organisation.

The foregoing account by Dr. Jessel of the actual work done in the dispensaries, will, I think, show clearly the utmost importance of the dispensary unit in the tuberculosis scheme.

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#### IV.—THE TREATMENT OF TUBERCULOSIS BY ARTIFICIAL LIGHT.

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##### INTRODUCTION.

In June, 1927, the County Tuberculosis Committee had before them the first special report on the results of the treatment of tuberculous patients by artificial light. The treatment was given in the tuberculosis dispensaries at Ashton-under-Lyne and Lancaster, where two experimental centres were established in 1925. These centres are under the charge of Dr. J. Logan Stewart and Dr. A. D. Brunwin, two of the consultant tuberculosis officers, who were granted leave of absence to enable them to study light treatment under eminent specialists. In this report are described the results of treatment for a further year, 1927, together with a list of equipment established at eight additional dispensaries; the cost of equipment and treatment; and two special clinical reports from Drs. Stewart and Brunwin on the patients under their charge.

A summary of the whole report, with conclusions, will be found on pages 35-39.

##### EXTENSIONS OF LIGHT TREATMENT.

The results of light treatment given to 187 patients in 1926, having been so good, the County Council, with the approval of the Ministry of Health, decided on the following programme :—

- (1) To establish, as and when possible, up to fifteen light centres at County tuberculosis dispensaries, this number allowing the provision of not exceeding three centres in each dispensary area.
- (2) To augment the tuberculosis medical staff by the addition of one assistant tuberculosis officer, and the nursing staff by the addition of three tuberculosis health visitors.
- (3) To defray the fares of necessitous patients attending light centres.

The types of lamp and the cost of equipment so far installed at ten of the tuberculosis dispensaries are contained in the table given on the next page.

## LAMP EQUIPMENT AT TUBERCULOSIS DISPENSARIES.

As the result of the experimental work at the Ashton-under-Lyne and Lancaster dispensaries, during which six types of lamp were used, it was found that the most suitable light equipment to meet the essential needs of a tuberculosis dispensary serving a populous area is—

Two long-flame carbon arc lamps (for general irradiation), consuming 30 amperes each, at 100 volts.

One Kromayer water-cooled mercury vapour lamp (for local treatment), consuming 5 amperes.

One mercury vapour lamp (Jesionek or Hanovia) (for general or local treatment), consuming up to 5 amperes.

In detailing this equipment no suggestion is intended that other lamps or sources of ultra-violet light, or other methods, are not equally satisfactory in producing results; but in the experimental work certain lamps and methods were ruled out because of the length of time taken and on account of the nursing assistance required. For example, the Finsen-Reyn lamp for local treatment was not suitable for dispensary work, and also on account of the number of cases requiring treatment it was not practicable to use the short-flame arcs with plain carbons as recommended by the Finsen Institute, on account of the longer exposures required.

In equipping a light centre much depends upon the nature of the electric supply—whether the current is direct or alternating, the voltage and the amount of current available. The consumption of 3 to 5 amperes by mercury vapour lamps is supplied without difficulty from the ordinary heating or power circuits. The carbon arc lamps require 30 amperes each at 100 volts. This may be more than can be obtained through some of the existing electric cables, and consequently motor generators\* have to be installed to produce the current required. This was necessary at the Lancaster and Ashton-under-Lyne dispensaries.

The following statement shows for each of the artificial light centres so far established, or in process of establishment, the types of lamp, the cost of equipment provided, together with the nature of the public electric supply :—

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\* A motor generator to deliver 100 volts costs between £90 and £100 ; because of the saving in current from the public supply, the cost of such a generator is repaid in a few years.

TABLE 4.

*Equipment at Light Centres.*

Tuberculosis Dispensary.	Date Light Centre Opened.	Lamp equipment as at June, 1928.	Electric current consumption of lamps.	Cost of all lamps and subsidiary equipment.	Nature of public electric supply.
Lancaster ....	15/7/25	* 1 Carbon arc ("Sunrae") (working from motor generator) 1 Kromayer m.v. .... 1 Hanovia m.v. ....	Amperes. 30 at 100 volts .... 5 5	£ 197	* D.c., 240 v.
Ashton-under-Lyne	11/9/25	2 Carbon arcs (Westminster)† (working from motor generator) 1 Kromayer m.v.† .... 1 Jesionek m.v. ....	60 at 100 v. .... 5 5	350	D.c., 240 v.
Chorley ....	14/10/26	1 Carbon arc ("Alpine Sun" four electrodes) 2 Jesionek m.v. .... 1 Kromayer m.v. ....	22 at 200 v. .... 5 each 5	220	A.c., 240 v.
Preston ....	29/11/27	1 Carbon arc ("Alpine Sun," four electrodes)‡ 1 Tungsten arc‡ .... 1 Kromayer m.v. ....	22 at 220 v. .... 5 5	135	D.c., 220 v.
Eccles ....	1/12/27	2 Carbon arcs ("Sunrae") 1 Kromayer m.v. .... 1 Jesionek m.v. ....	30 at 100 v. each .... 5 5	210	A.c., 200 v.
Stacksteads	9/1/28	2 Jesionek m.v. .... 1 Kromayer m.v. ....	5 each .... 5	170	A.c., 230 v.
St. Helens	16/1/28	2 Carbon arcs ("Sunrae") 1 Kromayer m.v. ....	30 at 100 v. each .... 5	150	D.c., 230 v.
Ulverston	5/6/28	2 Carbon arcs ("Sunrae") 1 Kromayer m.v. ....	30 at 100 v. each .... 5	172	A.c., 220 v.
Fleetwood	25/6/28	2 Carbon arcs ("Sunrae") 1 Kromayer m.v. ....	30 at 100 v. each .... 5	175	D.c., 200 v.
Radcliffe....	16/7/28	2 Carbon arcs ("Sunrae") 1 Kromayer m.v. .... 1 Jesionek§ .... 1 Sollux (luminous heat rays)§	30 at 100 v. each .... 5 5 5	225	D.c., 220 v.

\* Abbreviations : m.v. = Mercury vapour ; D.c. = Direct current ; A.c. = Alternating current ; v. = volt.

† One carbon arc and one Kromayer lamp gift of Ashton Care Committee.

‡ Both lamps transferred to Preston Dispensary from Lancaster Dispensary.

§ Gifts of Radcliffe, Whitefield and District Relief Fund Committee.

At the Ashton-under-Lyne Dispensary, in addition to the equipment specified in the foregoing table, the following lamps were tried for a period for experimental purposes : one K.B.B. mercury vapour, atmospheric type, and one K.B.B. mercury vapour for both local and general treatment. Similarly, at Lancaster Dispensary, the following additional lamps were tried : one K.B.B. mercury vapour, atmospheric type ; one tungsten arc lamp ; and one "Alpine Sun" carbon arc, which was replaced in May, 1928, by the "Sunrae" arc, owing to the lack of sufficient current.

## STAFFING OF LIGHT CENTRES.

The Administrative County is divided into five large dispensary areas with an average population of 340,000. The medical and



nursing staff for each of these areas consists of one consultant tuberculosis officer, two assistant tuberculosis officers, and four to seven tuberculosis health visitors. In addition there are two small dispensary sub-areas under the charge of the medical superintendents of the High Carley and Elswick Sanatoria, and the medical superintendents are the consultant tuberculosis officers for the sub-areas.

The treatment of patients has been carried out under the direct supervision of the consultant tuberculosis officer of each dispensary area with the medical and nursing staff under him. For the extra work thrown on the staff throughout the County area, one additional assistant tuberculosis officer and three additional tuberculosis health visitors have been appointed. During the first two years, however, all the experimental work in dispensary areas 1 and 3 was carried out by the staff with no increase, and this involved a great deal of overtime.

It has been found from experience that it is very desirable to have one nurse in charge of the light department, to be responsible for all the arrangements and for all the records, particularly when a Kromayer lamp forms part of the equipment. The other nurses in the dispensary area assist in rotation.

As the result of the experimental work done at Ashton-under-Lyne and Lancaster by Dr. Stewart and Dr. Brunwin respectively, it has been easy for the rest of the medical staff to learn the technique of light treatment. In addition to seeing the methods applied at these two dispensary light centres, the senior tuberculosis officers have also attended post-graduate courses arranged by the Joint Tuberculosis Council.

#### ARRANGEMENTS FOR AND METHOD OF TREATMENT.

##### *Selection of Cases.*

Patients for treatment are selected by the consultant tuberculosis officer who confers with the medical attendant; generally it is found that patients are anxious to avail themselves of this form of treatment. The cases chosen are almost entirely those suffering from non-pulmonary (surgical) tuberculosis and who are able to attend the dispensary. Occasionally patients are brought in spinal carriages or invalid chairs, but bed-ridden cases are almost invariably sent to a hospital.

##### *Frequency of Attendance.*

The frequency of attendance of patients for light treatment depends upon many factors, *e.g.*, the ability of the patient, if working, to obtain permission to attend the dispensary, the convenience of travel, the kind of light equipment installed, the type of carbons used with the arc lamps, and the nature and severity of the lesion. As a general rule, however, patients attend twice or three times per week:

it is advisable to allow an interval of at least one day between one exposure and another. For the convenience of patients who are working throughout the day, an evening session is held.

At Ashton-under-Lyne, Dr. Stewart found that the patients who attended twice per week made, as near as could be judged, as good progress as those who attended three times per week. On the other hand, the progress of cases who attended only once per week was noticeably slower. At Lancaster and Chorley the majority of cases attend twice per week only.

### *Duration of Exposure and Pigmentation.*

There is no set scale of exposures for patients, each case having to be considered on its merits after a test has been made of the sensitivity of the skin. A slight erythema is aimed at and pigmentation is allowed to develop. In general light baths the whole of the body is exposed, the front for half the time, the back for the other half. During treatment the eyes of the patients are protected by shades of red celastoid, which are made economically in the dispensary from large sheets of the material.

The duration of the exposure for the carbon arc lamps ("Sunrae" type) depends on the variety of cored carbons used, and the distance of the patient from the flame. The consultant tuberculosis officers have obtained much important technical experience in gauging the satisfactory duration of exposure, and the following statement shows the practice followed by Dr. Stewart and Dr. Brunwin, who have this type of arc lamp, for which they have used two varieties of carbons, viz., grade "A" (white flame) and the more powerful grade "C" (or Conradty) carbons :—

*Ashton-under-Lyne Dispensary.*—With grade "A" carbons the usual initial exposure is five minutes to back of body and five minutes to front of body, increasing gradually to 15 minutes back and 15 minutes front, at a distance of three feet; when this stage is attained, the distance is reduced by degrees to two feet.

With grade "C" carbons the usual initial exposure is one minute back and one minute front, increasing to a maximum of six minutes back and six minutes front, at three feet distance.

*Lancaster Dispensary.*—With grade "A" carbons the usual initial exposure is five minutes back and five minutes front, increasing to 15 minutes back and 15 minutes front, at a distance of  $2\frac{1}{4}$  feet.

With grade "C" carbons the initial exposure in most cases has been three minutes back and three minutes front, increasing to a maximum of 20 minutes back and 20 minutes front, at a



distance of three feet. Alternatively, the distance is reduced to  $2\frac{1}{4}$  feet, and the maximum exposure  $12\frac{1}{2}$  minutes back and  $12\frac{1}{2}$  minutes front.

Both Dr. Stewart and Dr. Brunwin report that the progress made by patients having light treatment from the grade "C" carbons has been quite satisfactory. Dr. Stewart treats adults with the "C" carbons and children with "A" carbons, and states that, were there sufficient time available, he would treat all the patients with the "A" variety. The advantage of using grade "A" carbons only is that the same type of carbon can then be used for all patients (children and adults), and there is no danger of the carbons being mixed.

For local treatment with the Kromayer quartz mercury vapour lamp the exposures vary from two minutes to fifteen minutes. In some cases it is given at distances of one quarter inch or two inches, and in other cases pressure is applied by means of quartz rods and lenses. Patients requiring local treatment are also given general treatment, unless there are indications that this course is inadvisable.

With the Jesionek and Hanovia mercury vapour lamps, which are available for local or general irradiation, the exposures are graded from a half-minute to fifteen minutes, back and front, making a maximum exposure of half-an-hour. For local treatment, exposures up to half-an-hour are given. It should be understood, of course, that with the mercury vapour lamps (Kromayer and Jesionek) the minimum and maximum exposures will vary with the age of the lamp, increasing gradually as the output of the lamp diminishes.

#### *Records.*

A register is kept of patients' attendances for treatment, and on a personal record form are entered particulars as to weight of patient, temperature, attendances, lamp used, exposures, and distance from lamp. Photographic records are now made of many cases undergoing treatment.

#### *Patients' Travelling Expenses.*

The County Tuberculosis Committee have authorised the payment of the railway, bus or tram fares of necessitous patients, and this is being done. With the present amount of unemployment about 26 per cent. of the cases under treatment early in 1928 have been so assisted, otherwise they could not have attended for treatment. In deciding whether fares should be paid, the tuberculosis officers are guided by the family income scale adopted by the County Tuberculosis Committee for care work.

#### *Average Duration of Treatment.*

The duration of treatment has varied widely according to the type of non-pulmonary disease. Taking the several groups of cases in which the disease has become "quiescent and apparently cured"

the average duration is as follows. For comparative purposes the duration of the disease before artificial light treatment commenced is also shown :—

TABLE 5.

Cases quiescent and apparently cured after light treatment in 1927.	Type of tuberculous case—all with active disease when commencing treatment.			
	Lupus.	Adenitis with abscess formation and skin involvement.	Adenitis without softening.	Other lesions.
<i>Ashton-under-Lyne, Lancaster and Chorley Dispensaries.</i>				
Number of cases ... ..	25	30	26	29
Average duration of light treatment ...	Months. 13·0	Months. 5·6	Months. 7·6	Months. 4·7
For comparison : Average duration of disease <i>before</i> commencement of light treatment ... ..	153·5	45·6	41·9	21·7

## RESULTS OF LIGHT TREATMENT.

The following tables show the results of treatment at each of the three light centres at work in 1927 :—

TABLE 6. (a) *Ashton-under-Lyne.*

Form of Tuberculosis or part of body affected.	No. of Cases.	Condition of Patients whose Treatment concluded in 1927.				Still under treatment at end of year.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.	
Lupus ... ..	49	23	...	...	...	26
Adenitis with abscess formation and skin involvement ...	29	18	...	...	...	11
Adenitis without softening ...	19	16	...	...	...	3
Lungs ... ..	1	...	...	...	...	1
Other lesions† ... ..	34	8	...	...	...	26
TOTAL for 1927 ...	132*	65	...	...	...	67
For comparison the total in 1926 was ... ..	150†	91	...	...	...	59

\*1927 : Adults, 89 ; children, 43.

†1926 : Adults, 88 ; children, 62.

‡Other lesions include tuberculosis of bones and joints, abdomen, empyema, bronchial glands (diagnosed on symptoms and skiagram), adenitis and lungs, and kidney.



The table does not include 16 patients who ceased treatment for other than medical reasons, chiefly through inability to attend.

In addition to the 132 active cases dealt with in the above table, there were 3 cases whose condition was quiescent on commencing light treatment and remained so until completion of course. The object of treatment was to prevent a possible recurrence of active disease.

TABLE 6. (b) *Lancaster.*

Form of Tuberculosis or part of body affected.	No. of Cases.	Condition of Patients whose Treatment concluded in 1927.				Still under treatment at end of year.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.	
Lupus ... ..	6	1	...	...	...	5
Adenitis with abscess formation and skin involvement ...	3	2*	...	...	...	1
Adenitis without softening ...	3	2	...	1	...	...
Lungs, sputum positive ...	3	...	...	3	...	...
Other lesions† ... ..	18	13	...	...	1	4
TOTAL ... ..	33‡	18	...	4	1	10
For comparison, the total in 1926 was ... ..	37§	15	...	....	...	22

\* One patient also received two injections of tuberculin (B.E.).

† Other lesions include tuberculosis of bones and joints, testicle, and bronchial glands (diagnosed on symptoms and skiagrams).

‡ Adults, 19 ; children, 14. § Adults, 22 ; children, 15.

In addition to the 33 active cases dealt with in the above table, there were 15 cases (10 adults, 5 children—mainly bone and joint cases) whose condition was quiescent on commencing light treatment and remained so until completion of the course. The object of treatment was to prevent a possible recurrence of active disease.

The table does not include one patient who was transferred to the light centre established at Preston Dispensary, four patients who did not complete one month's treatment, and four patients who ceased treatment for other than medical reasons.

TABLE 6. (c) *Chorley.*

Form of Tuberculosis or part of body affected.	No. of Cases.	Condition of Patients whose Treatment concluded in 1927.				Still under treatment at end of year.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.	
Lupus ... ..	6	1	...	...	...	5
Scrofulo-derma ... ..	1	1	...	...	...	...
Adenitis with abscess formation and skin involvement ...	19	10	...	...	...	9
Adenitis without softening ...	15	8	...	...	...	7
Other lesions† ... ..	24	7	1	...	...	16
TOTAL ... ..	65*	27	1	...	...	37

\*Adults, 29 ; children, 36.

† Other lesions include bones and joints, abdomen, cervical glands, ulcer of tongue, kidney, abscess of chest wall, testicle, finger ; several of the cases were complicated by pulmonary tuberculosis or lupus.

In addition to the 65 active cases dealt with in the above table, there were 22 cases (5 adults, 17 children—mainly gland cases) whose condition was quiescent on commencing light treatment and remained so until completion of the course. The object of treatment was to prevent a possible recurrence of active disease.

The table does not include 16 patients who ceased treatment at own request or because of removal from district, admission to sanatorium or hospital, transfer to the light centre established at Preston Dispensary.

#### *Notes on Results.*

The term “quiescent and apparently cured” has been chosen to express the condition of a lesion which has been healed by artificial light treatment. By direction of the Ministry of Health no case of non-pulmonary tuberculosis is written off the tuberculosis register as “cured” until three years have elapsed without any signs or symptoms of active disease.

The results contained in the three foregoing tables, which deal with the work done in 1927, together with the experience gained since the light centres were opened, show that a large number of patients suffering from various forms of non-pulmonary tuberculosis can be treated successfully by artificial light at tuberculosis dispensaries. As reported last year, there are two groups of cases, namely, (i) lupus,



and (ii) adenitis with abscess formation and skin involvement—both groups so unresponsive to other forms of treatment—which have benefited very greatly by light treatment, and the continued good results in these cases confirm the value of artificial light treatment and justify the steps which have been taken to establish light centres for the treatment of such cases.

#### REPORTS BY DRs. STEWART AND BRUNWIN ON THE WORK AT THEIR DISPENSARY LIGHT CENTRES.

Dr. Stewart, the consultant tuberculosis officer responsible for the Ashton-under-Lyne Dispensary light centre, has furnished the following report :—

##### *Selection of Cases.*

Only those cases were accepted for light treatment which were suitable for treatment at a dispensary. No attempt was made to treat pulmonary tuberculosis on any considerable scale, and cases of hip joint and spinal disease were not dealt with.

A skin test is made when possible before treatment is commenced, in order to determine the sensitivity of the skin. Re-actions are carefully noted in order to decide as to rate of increase of exposure, and the patients are asked at each visit as to headaches, sleeplessness, lassitude, &c., symptoms which may indicate over-dosage or unsuitability of the case for light treatment. A slight erythema is aimed at in treatment, and pigmentation is allowed to develop.

The urine is always tested, and the chest examined before light treatment is commenced. A skiagram of the chest is also taken, and this, in my opinion, is essential in all cases of non-pulmonary tuberculosis, as unsuspected lesions in the lungs are sometimes revealed.

The Jesionek type of mercury vapour lamp is used both for general and local treatment. The carbon arcs are preferred for general irradiation, but the mercury vapour lamp is available in case of any breakdown of the carbon arc lamps, and it is used for local treatment in abdominal, joint and glands cases, where reactions of the third degree are desired.

Of the 137 cases treated during the year, 132 had general light baths with the carbon arcs. Of these 132 cases, 22 had local treatment with Jesionek light, 51 had local treatment in addition by the Kromayer lamp, and 5 had local treatment by both the Jesionek and Kromayer, leaving a balance of 54 patients, who had general light baths only. Five cases were given local treatment only without general light baths.

Where possible, patients attend three times per week, the exposures being given on alternate days. In a County area, however, where many of the patients have to travel long distances, some of them can only attend twice a week, and a number who are working can only attend the one evening session. The patients who have attended twice per week have made satisfactory progress, and indeed have done just as well as those who have attended three times a week. Progress in the cases attending only once a week was noticeably slower.

Of 98 adult patients who are at present receiving light treatment, 72 are carrying on their usual occupation. Many of them get permission to be off work for two half-days per week ; some come on the one evening session and get leave from work on one half-day. It is possible, therefore, for the majority of adult patients to continue at work while receiving treatment. The great majority of the children who are attending for treatment are also attending school.

*Pigmentation.*

The pigmentation in the cases becoming quiescent was :—good, 24 ; moderate, 12 ; slight, 27 ; nil, 2.

Pigmentation in the three chief groups of these cases was as follows :—

	Good.	Moderate.	Slight.	Nil.	Total.	Average Duration of Treatment : Months.
Lupus ... ..	11	2	7	3	23	13·8
Adenitis with abscess formation and skin involvement	7	4	7	...	18	7·0
Adenitis without softening	3	3	10	...	16	10·8

The degree of pigmentation, therefore, bears no direct relationship to the progress of the patient. The patients with good pigmentation gained on the average 6 lbs. in weight, whereas the group of slight and non-pigmenters gained on the average 2·7 lbs. In the previous year, however, the average gain in weight of the good pigmenters was 7 lbs., as compared with an average gain of 6 lbs. by the slight and non-pigmenters.

*Weight.*

The average gain in weight for all the quiescent cases was—for adults, 3·8 lbs., and for children 4·6 lbs.

The average gain in weight for the three chief groups of quiescent cases was as follows :—

	Average gain in weight.	No. of cases.	Average Duration of Light Treatment : Months.
Lupus ... ..	4 lbs.	23	13·8
Adenitis with abscess formation and skin involvement ...	2 lbs.	18	7·0
Adenitis without softening ...	6 lbs.	16	10·8

The number of patients who gained 14 lbs. or over in weight was 25. The highest gain in weight was 33 lbs., which occurred in the case of an adolescent with extensive lupus.

*Observations on the Various Types of Case Treated.**(a) Lupus Vulgaris.*

Of 66 cases of lupus vulgaris which have been treated to the end of 1927 since the commencement of light treatment here, 44 have become quiescent. Only one case has remained stationary, the others are all improving. It is a matter of good fortune that only one case has occurred which has remained uninfluenced by light treatment, as a small percentage, from 5 to 10 per cent., of lupus vulgaris cases are stated to remain uninfluenced even by prolonged light treatment.

All the cases do not respond to light treatment in the same way. An early lesion does not necessarily yield more rapidly than an old and extensive lesion. Often the contrary is the case. Some of the old and very extensive lesions yield very rapidly to light treatment, whereas many of the early cases take a comparatively long time to cure when the extent of the disease is taken into account. This is probably due to the fact that in the older lesions the tubercle bacilli are of lower virulence than in the early lesions.

Local treatment (Kromayer lamp) was given in all but one of the lupus cases, and general irradiation was given in all of the cases except two.

It seems to be advisable in each case to begin the general irradiation before the local, in order to get the skin and lesion into better condition for the local treatment which is applied afterwards.

Patients who have had no previous treatment such as x-rays, acid, scraping, are more satisfactory to treat, as the resultant scar is better. The old cases with extensive fibrous scarring, most of which have had x-ray treatment, give rise to a good deal of difficulty and anxiety because of the tendency these scars have to break down and in some cases to become malignant. My experience is that the general light baths help to keep these scars in better condition and to prevent the tendency to break down. Local treatment at the active margins in these cases has to be administered very carefully. I have come to the conclusion that it is advisable in the old quiescent cases with unsatisfactory scars to give them a course of general light baths every year in order to keep the skin in as healthy a condition as possible.



The nature of the scar which follows on light treatment depends very much on the individual skin reaction to light. The skin of no two individuals reacts in quite the same way. In some cases the scar is soft and pliable, in others it is more fibrous, and, in a few, keloid thickening develops. I do not think that this is due entirely to the particular kind of lamp employed.

Many of the old lupus cases have eye conditions due either to direct extension of the disease to the lids, &c., or secondary to the disease. Considerable improvement in the eye conditions has resulted in all these cases, the cornea becoming clearer, the patient seeing better, and the conjunctivitis greatly improved.

It is most important that, after the disease becomes quiescent and treatment is concluded, patients should attend at intervals at the clinic for observation. Although the lesion may seem arrested and no active areas be found on the most careful examination, there is no guarantee that such a case may not return later on with recurrence at one or more spots. Of the cases which have been classified as quiescent, one case so far has returned with recurrence of the disease. This localised recurrence has yielded rapidly to further light treatment.

The necessity of close and unceasing after-care of these cases is well illustrated in one case of a girl, aged 11 years, with lupus of the face, who was in a sanatorium for  $3\frac{1}{2}$  years where she received local and general light treatment by the most approved Finsen-Reyn methods. Two years after her discharge from the sanatorium with disease arrested, she developed a local recurrence of the disease at the margin of the old lesion. This has been treated and has yielded rapidly to local and general light treatment.

If it can possibly be arranged, it is a good plan to give the quiescent cases a prophylactic period of general light treatment each year.

For the cases of lupus which became quiescent, the average duration of treatment was 13.8 months. The average duration of disease in these cases before treatment commenced was 12.5 years.

#### (b) Lupus Erythematosus.

Four cases of this disease have received treatment.

The causation of this form of lupus is obscure. Some authorities believe that it is of tuberculous origin; others believe it is caused by the toxins of other organisms such as streptococci.

It differs clinically in some respects from lupus vulgaris, and it certainly differs in the manner in which it responds to light treatment.

In one of the four cases there was a family history of tuberculosis. In the other three the family history was negative. Three of the four cases were of the chronic type of lupus erythematosus, and while light treatment improved the skin condition to some extent and improved the general condition of the patients, it made no real progress towards eradication of the disease. A combination of light treatment with vaccine treatment is being tried. The other case was of disseminated lupus erythematosus. The eruption on the face responded to the light treatment and did extremely well, but later, after light treatment was concluded, she developed symptoms of nephritis, which is one of the terminal complications in this form of the disease.

#### (c) Scrofulo-derma.

Scrofulo-derma, originating from suppurating glands, or from bone and joint sinuses, responds quickly and well to general irradiation, and the resultant scars are very good. In a few cases local treatment is necessary to hasten cure.

Some of the cases now classed as lupus vulgaris, which show the clinical signs of that condition, were originally cases of scrofulo-derma from suppurating adenitis. It is acknowledged that the one type of lesion can pass over into the other. Since light treatment was commenced no case of scrofulo-derma has refused to respond to treatment, and it would seem, therefore, that light treatment will lessen the number of new cases of lupus vulgaris by curing all the cases of scrofula.

#### (d) Adenitis.

When glands break down and sinuses form, light treatment gives excellent results and the scars that remain are very satisfactory.

For the cases of adenitis with abscess formation, the average duration of treatment was 7.0 months; the average duration of the disease in these cases before treatment commenced was four years.

But where glands do not suppurate, and these form a large group of the cases treated, there is not the same certainty that light acts in a specific way. In a large proportion of the cases the glands decrease in size coincident with the light treatment and no further treatment has been required other than light. It is very seldom now that a case of this kind is recommended for surgical treatment. Occasionally where there is a large, solitary, firm gland which is causing noticeable deformity, surgical removal is probably the best treatment, but, in the majority of cases, chains of glands are involved, and light treatment is, in my opinion, preferable to surgical methods.

In the majority of the cases, calcification takes place, leaving small, firm, residual glands; this can be demonstrated by skiagrams of the neck, &c. The glands are usually reduced to a size that does not cause any noticeable deformity.

For the cases of adenitis without softening, the average duration of treatment was 10·8 months. The average duration of disease in these cases before treatment commenced was  $3\frac{1}{2}$  years.

(e) Abdominal Tuberculosis.

Bone and Joint Tuberculosis.

Multiple Tuberculosis.

In regard to the other groups of cases, abdominal, bones, joints, &c., satisfactory results have been obtained in a number of instances, but the numbers in each group have been too small to justify definite conclusions being drawn.

The results of treatment of old sinuses from bone and joint disease have been variable. Those that healed, healed up quickly, and there has been no recurrence. In some of these cases the sinuses had been discharging for years. On the other hand, there are old sinuses, especially from hip joint disease, which have resisted all forms of treatment, including surgical, and are still discharging.

Cases of multiple tuberculosis have yielded exceedingly good results with light treatment. Where, however, there is a quiescent lesion in the lungs, in addition to the non-pulmonary lesions, the light treatment should be given with caution, and it is noticeable that in these cases the patients do not gain weight and their general condition does not improve to the same extent as in cases where there is no "clinical" lung lesion.

(f) Bazin's Disease.

One case of this disease which received treatment in 1926, and became quiescent, had recurrence of the disease during 1927. She improved again while having light treatment, but it is not at all certain that the light treatment produced any direct effect on the lesions, and certainly it does not prevent recurrence. The patient, however, desired to have the light, expressed herself as feeling better with it, and stated that the lesions cleared up more quickly than they used to do before she had the light treatment. This case also had tuberculous glands of the neck, with multiple sinuses and no recurrence of this lesion has taken place.

Dr. Brunwin, the consultant tuberculosis officer for Dispensary Area 1, with the aid of Dr. G. H. Leigh, the assistant tuberculosis officer who supervises the light treatment at Chorley, has furnished the following report on the treatment given at the Chorley and Lancaster dispensaries:—

*Lancaster Dispensary.*

The portion of the County served by the Lancaster dispensary comprises large areas of a rural character, and there are only two populous towns—Lancaster and Morecambe. Consequently, the number of cases of non-pulmonary tuberculosis suitable for light treatment is not so great as in the industrial centres, and the patients have to travel longer distances.

In selecting the type of carbon arc for general treatment at the Lancaster dispensary, regard had to be paid to the electric supply available from the existing cable. The amperage required for the usual pattern of long-flame arc is 30, and



as this quantity could not be obtained, an "Alpine Sun" lamp, with four electrodes, mounted on a stand, wired in series of 160 volts (giving 40 volts to each arc), consuming 15 amperes, was provided. As the results were not satisfactory, the amperage was raised to 18 which, with the use of iron-cored carbons instead of the weaker white-flame variety, gave improved re-action. With this lamp it was only practicable to treat groups of two patients each. After two years' trial, it was decided to obtain a "Sunrae" long-flame carbon arc, and to overcome the difficulty in current a motor-generator was installed in the dispensary to deliver 30 amperes at 100 volts. The new lamp, which was brought into use in October, 1927, has the advantage—apart from other considerations—of being suitable for treating groups of four patients, thus saving much time of the staff.

For local treatment, a tungsten arc lamp was provided early in 1927. "Tungsten steel" rods were employed as they were cheaper than the pure tungsten. After trial over a period of six months, during which I observed the results obtained at other centres by different types of lamps, I applied for, and was granted a Kromayer water-cooled mercury vapour lamp, which gave much more satisfactory results.

A further lamp—an atmospheric type of mercury vapour lamp—was supplied when the centre was opened in 1925, but I found it unsatisfactory and obtained in its place a vacuum mercury vapour (Hanovia type), which has proved entirely satisfactory.

The "Alpine Sun" carbon arc lamp and the tungsten arc lamp were transferred to the Preston dispensary (in my area) where a light centre was established towards the end of 1927.

The original lamp equipment was obtained partly to try certain types of lamps in comparison with other types which were being used by Dr. Stewart who was carrying on, at the same time, experimental work (with a much larger number of patients) at Ashton-under-Lyne. In reviewing the results of treatment at Lancaster, these several changes in lamp equipment, and the relatively small number of patients treated, should be borne in mind; the results refer chiefly to those obtained by the "Alpine Sun" lamp and the tungsten arc lamp.

At Lancaster, altogether 48 cases were treated in 1927, of which 33 were active and 15 quiescent. A fairly large number of the quiescent cases were treated for a general tonic effect and to prevent a relapse. There is considerable desire on the part of patients, who have once had light treatment, for further courses. The types of cases treated comprised most forms of non-pulmonary tuberculosis, and also tuberculosis of the bronchial glands. Definite objective improvement in the latter type of case was noticed, but the gain of weight was not very marked as a rule. The general condition, however, seemed to undergo an improvement. The results of treatment are given in the table on page 27.

At the Lancaster Dispensary, of the 15 cases becoming quiescent and apparently cured in 1926, one case (a girl with adenitis) suffered a recurrence early in 1928, and she was sent to a general hospital for surgical treatment.

Only three cases of tuberculosis of the lungs with positive sputum and without any non-pulmonary complication were treated, and no improvement in the lung condition occurred in any of these.

The average gain in weight for 18 active cases becoming quiescent was 1 lb. 10 oz. after an average period of treatment of nearly three months.

Pyrexia to a slight extent occurred on many occasions after treatment, but not often over 99.6°.

No other case was treated during the year on which any special comment can be made.

When the "Sunrae" carbon arc lamp was installed, I adopted a maximum exposure of fifteen minutes back and fifteen minutes front at 27 inches distance, using grade "A" (or white-flame) carbons. After several weeks usage of these carbons, I changed to the more powerful grade "C" carbons and altered the exposures to 25 minutes back of the body and 25 minutes front, at a distance of 36 inches; and, as an alternative, to 12½ minutes each way at 27 inches, these exposures being the maximum. I consider that the grade "C" carbons gave satisfactory results and I still use them.

*Chorley Dispensary.*

The following results as regards Chorley have been compiled partly by Dr. Leigh, who supervises the light treatment at that centre.

The only lamp in use at Chorley in 1927 was an "Alpine Sun" carbon arc lamp with four electrodes. This apparatus, which is for general irradiation, was provided to afford a comparison in the results of cases treated by a similar type of lamp at Lancaster, where difficulty was experienced in securing sufficient current. It has four electrodes, coupled in series, taking 50 volts for each arc, and consumes 22 amperes. White-flame carbons were used at first; then a trial was given to the iron-cored variety, but discontinued in favour of the white-flame carbons. The maximum exposure at each session is fifteen minutes back and fifteen front at a distance of thirty inches. Additional lamp equipment—two Jesionek mercury vapour lamps and one Kromayer lamp—were obtained in June, 1928.

In 1927, 65 patients with active disease received treatment, together with 22 classified as quiescent. The results are given in the table on page 28. Owing to the absence of a lamp for local treatment, only six cases of lupus were treated, one of which became quiescent. With the additional lamps now supplied, Dr. Leigh anticipates better results of treatment in 1928.

The effect on the weight of the patients has been variable, both losses and gains being recorded. The average gain in weight in the 27 active cases becoming quiescent and apparently cured was 1 lb. 6½ oz. for an average duration of 3·5 months.

Most of the patients say they feel much better, and improvement in general condition has been quite noticeable in the case of some of the children in whom it has not been possible to demonstrate any local improvement.

### THE COST OF LIGHT TREATMENT AND ITS RELATION TO NUMBER OF HOSPITAL BEDS REQUIRED.

The cost of the artificial light treatment at the three experimental centres is as follows:—

	Dispensary.					
	Ashton.		Lancaster.		Chorley.	
	s.	d.	s.	d.	s.	d.
(1) Average cost per patient per week—						
(a) Current and carbons only ...	0	2½*	0	8*	0	4
(b) Standing charges, <i>i.e.</i> , proportion of time of tuberculosis officer, tuberculosis health visitor, fuel, light, cleaning, rent, rates and depreciation ...	3	0½	4	11	2	11
Total ...	3	3	5	7†	3	3

\*Motor generator provided at Ashton and Lancaster Dispensaries.

† The cost at Lancaster is greater than that at Ashton owing to the smaller number of patients treated.

	Ashton.	Lancaster.	Chorley.
(2) Capital cost of lamps and subsidiary light equipment ...	£350	£197	£220
(3) Number of cases with active disease treated in 1927 ...	132	33	65



The cost of light treatment should, however, be considered in conjunction with other forms of treatment which otherwise some of the patients would in all probability have received. Taking the 110 cases which have become quiescent after treatment at the three light centres, 44 of the cases would have been recommended for admission to special or general hospitals, and 28 for out-patient treatment at the Manchester Skin Hospital.

Knowing the average duration of institutional treatment for such cases and the cost, one can make a comparison between the expense involved in light treatment for these 110 patients and ordinary institutional treatment :—

Actual complete cost of 110 patients cured by light treatment at County dispensaries—	Estimated cost of residential and out-patient treatment if patients had been sent to hospitals—
£525	£1436

Thus, apart from other considerations, a very considerable financial saving—£911—has been effected on the treatment of these 110 patients.

Related to the opening of the three light centres is the number of beds in occupation at general hospitals at the end of 1927. It is ten less than in 1924, when no light treatment was provided :—

Dec. 31st, 1927—No. of beds occupied in general					
	hospitals ...	...	...	...	24
Do. 1924—	do.	do.	...	...	34

Similarly, the number of cases attending the Manchester Skin Hospital out-patient department has also declined :—

Dec. 31st, 1927—No. of patients attending Skin Hospital	163
Do. 1924—	do. do. ... 284

## SUMMARY AND CONCLUSIONS.

### 1.—*Lamps.*

Certain conclusions were reached in 1926 as to the best kind of lamps for use in tuberculosis dispensaries. The additional experience of work during 1927 has confirmed the suitability of the following lamps, which have now become the standard equipment for each dispensary :—

- 2 Long-flame carbon arc lamps for general treatment.
- 1 Mercury vapour lamp (Jesionek or Hanovia), for general or local treatment.
- 1 Kromayer water-cooled quartz mercury vapour lamp for local treatment.

## 2.—*Light Centres.*

At the date of this report, July, 1928, there are now one or more light centres in full working order in each dispensary area. The tuberculosis dispensaries which have been equipped in the different areas are as follows :—

TABLE 7.

Dispensary Area.		Population.	Centre.
1	...	255,076	Lancaster, Preston, and Chorley.
2	...	355,674	Stacksteads.
3	...	368,383	Ashton-under-Lyne and Radcliffe.
4	...	342,606	Eccles.
5	...	378,948	St. Helens.
Furness Sub-area		39,328	Ulverston.
Fylde Sub-area		60,285	Fleetwood.

This report deals with results of treatment at Ashton, Lancaster and Chorley only ; no other centres were open throughout 1927.

### 3.—*Cost of Equipment.*

The capital cost of the lamps (as enumerated in the table on page 22) and subsidiary equipment has varied from £135 at Preston Dispensary to £350 at Ashton-under-Lyne (the latter including a motor-generator and the value of two lamps kindly presented by the Ashton Voluntary Care Committee).

#### 4.—Staffing of Centres.

The Administrative County is divided into five large dispensary areas with an average population of 340,000. The medical and nursing staff for each of these areas consists of one consultant tuberculosis officer, two assistant tuberculosis officers, and four to seven tuberculosis health visitors. In addition there are two small dispensary sub-areas under the charge of the medical superintendents of the High Carley and Elswick Sanatoria, and the medical superintendents are the consultant tuberculosis officers for the sub-areas.

The treatment of the patients has been carried out under the direct supervision of the consultant tuberculosis officer of each dispensary area and the medical and nursing staff under him. For the extra work thrown on the staff throughout the County area, one additional assistant tuberculosis officer and three additional tuberculosis health visitors have been appointed. For the first two years, however, all the experimental work in dispensary areas 1 and 3 was carried on by the ordinary staff without assistance, and this involved a great deal of overtime.



### 5.—*Patients' Attendance.*

The attendance of the patients, usually twice or thrice per week at the light sessions, has again been satisfactory ; necessitous patients are enabled to travel by reason of their being allowed railway, 'bus or tram fares. *About three-fourths of the patients attending have been able to continue their normal occupations during treatment.*

### 6.—*Duration of Treatment.*

The average duration of light treatment at Ashton-under-Lyne, Lancaster and Chorley for cases completing treatment in 1927 and becoming quiescent and apparently cured was 7·5 months. Prior to commencing light treatment these patients had been undergoing other forms of treatment for a much longer average period, namely, 63 months.

### 7.—*Saving of Institutional Treatment.*

The work at the three light centres where patients were treated in 1927 has confirmed previous experience that a number of non-pulmonary cases of tuberculosis, which would otherwise be sent to institutions for residential or out-patient treatment, can be treated at dispensary light centres with greater economy and not less beneficial results. Of the 110 cases concluding treatment in 1927 on attaining quiescence of disease, the consultant tuberculosis officers would normally have recommended 44 for treatment at special or general hospitals, and 28 for out-patient treatment at a skin hospital. Based on the average duration of treatment of such cases the cost of their treatment would have been not less than £1,436, whereas their treatment at the dispensary light centres actually cost (all inclusive) £525, a saving of £911.

This must be regarded as satisfactory, and a corresponding saving may be expected with every confidence from the other light centres which are being established at the other dispensaries.

While light treatment at dispensaries near patients' homes will save in the long run much institutional accommodation, it must always be remembered that there are several forms of non-pulmonary tuberculosis which can only be treated properly in general or special hospitals.

### 8.—*Results of Light Treatment.*

The results of treatment of cases of non-pulmonary tuberculosis in 1927 have been, as in 1926, very satisfactory, particularly in two groups of cases, namely, (i.) lupus, (ii.) adenitis with abscess formation and skin involvement. These conditions usually are refractory to other forms of treatment. The good results for group (i.) have been achieved at the Ashton-under-Lyne centre (there were no suit-

able lamps for local treatment at Lancaster and Chorley), and for groups (ii.) at Ashton, Lancaster and Chorley, as the following table shows :—

TABLE 8.

Lesion.	Light Centre.	Year.	No. of cases treated.	Treatment concluded 1927. Quiescent & apparently cured.*	Still under treatment at end of year.
(i). Lupus ... ..	Ashton-u-Lyne	1926 } & 1927 }	70	44	26
(ii). Adenitis (with abscess formation and skin involvement) ...	Ashton-u-Lyne	1926 } & 1927 }	55	44	11
	Lancaster	1926 } & 1927 }	7	6	1
	Chorley ...	1927	19	10	9
	Total ...	...	81	60	21

\* The term “quiescent and apparently cured” has been chosen to express the condition of a lesion which has been healed by artificial light treatment. By direction of the Ministry of Health no case of non-pulmonary tuberculosis is written off the tuberculosis register as “cured” until three years have elapsed without any signs or symptoms of active disease.

These results are remarkably good, particularly when it is remembered that many of the lupus cases had been under treatment for so long as 20 to 40 years prior to commencing light treatment.

The results of treatment of other types of disease, *e.g.* tuberculosis of the bones and joints, adenitis (without softening), &c., have also in many cases been satisfactory, although the proof of efficiency of light treatment is not so striking, because those cases also respond fairly satisfactorily to other forms of treatment.

Five cases of active pulmonary tuberculosis with positive sputum have been treated without satisfactory results.

No general rule can be laid down as to how particular persons will react to the light as the response to the treatment varies within very wide limits. It cannot be too strongly emphasized that each patient must receive individual treatment and attention so far as initial exposure and graduation of exposure is concerned. Wherever possible a test exposure should be made before beginning treatment in order to ascertain the sensitivity of the skin.

Of the 91 cases becoming quiescent and apparently cured in 1926 after light treatment at the Ashton-under-Lyne Dispensary, two had a recurrence of the disease, namely, one case of lupus vulgaris and one case of Bazin's disease and tuberculous adenitis.





No. 1. S.W. Aged 50. Lupus of face. Duration of disease before light treatment commenced, 33 years. Previous treatment :—X-rays, scraping, etc.



No. 2. Condition after 15 months treatment with general carbon arc baths and Kromayer locally. Disease quiescent. The ectropion which persists is due to contraction of the skin caused by the old fibrous scars below the eyes. Pigmentation fair. Gain in weight, nil.









No. 3. F.V. Aged 15. Lupus of neck and face. Duration of disease before light treatment commenced, 10 years. Previous treatment:—X-rays, acid, etc. Condition in November, 1927.



No. 4. Condition after 8 months' artificial light treatment with general carbon arc baths and Kromayer locally. Disease quiescent. Gain in weight, 10 lbs. Pigmentation slight.







No. 5. V.L. Aged 27. Lupus of hand. Duration of disease before light treatment commenced, 7 years. Had had surgical treatment 7 years previously. Condition in August, 1927, when treatment commenced.



No. 6. Condition after 10 months' treatment with general carbon arc baths and local treatment by Kromayer. Disease arrested. Scar soft and pliable. Pigmentation very good. Gain in weight, nil.







No. 7.—M.B. Aged 7. Lupus, very extensive, over whole of back of right thigh and lower half of back of right leg. Duration of disease before light treatment, 5 years. Previous treatment: Attended out-patient department of a special hospital seven times in 1924, then placed by parents under a "quack" until seen by a doctor in January, 1928, who referred case immediately to tuberculosis officer.

(Photo taken on ordinary anti-screen plate).



No. 8.—Condition after six months' treatment with general carbon arc baths (plain carbons) and Kromayer mercury vapour lamp locally (52 exposures). Disease very much improved and many old active areas cured; patient still continuing treatment. Pigmentation good; gain in weight, 4 lbs.

(Photograph taken on panchromatic plate with light filter).





At the Lancaster Dispensary, of the 15 cases becoming quiescent and apparently cured in 1926, one case (a girl with adenitis) suffered a recurrence early in 1928, and she was sent to a general hospital for surgical treatment.

No patient has had any permanent ill-effect, either local or general, at any of the dispensary light centres.

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#### PHOTOGRAPHIC RECORDS.

In order to record the progress made by patients, photographs have been taken of a number of cases on commencing, during, and on terminating treatment. The following are photographs of three (Nos. 1 to 6) cases treated at the Ashton-under-Lyne light centre and one (Nos. 7 and 8) at the Eccles centre, which have been selected as illustrating the effect of light treatment. The upper photograph shows the condition of the patient prior to commencing light treatment, and the lower photograph the appearance of the affected part on conclusion of treatment.

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## V.—TUBERCULOSIS AND SILICOSIS.

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I am much indebted to Dr. J. Logan Stewart, the consultant tuberculosis officer for Dispensary Area 3, for the material contained in this chapter, and for the notes on the skiagrams (some being his own and the rest taken by other senior members of the tuberculosis staff).

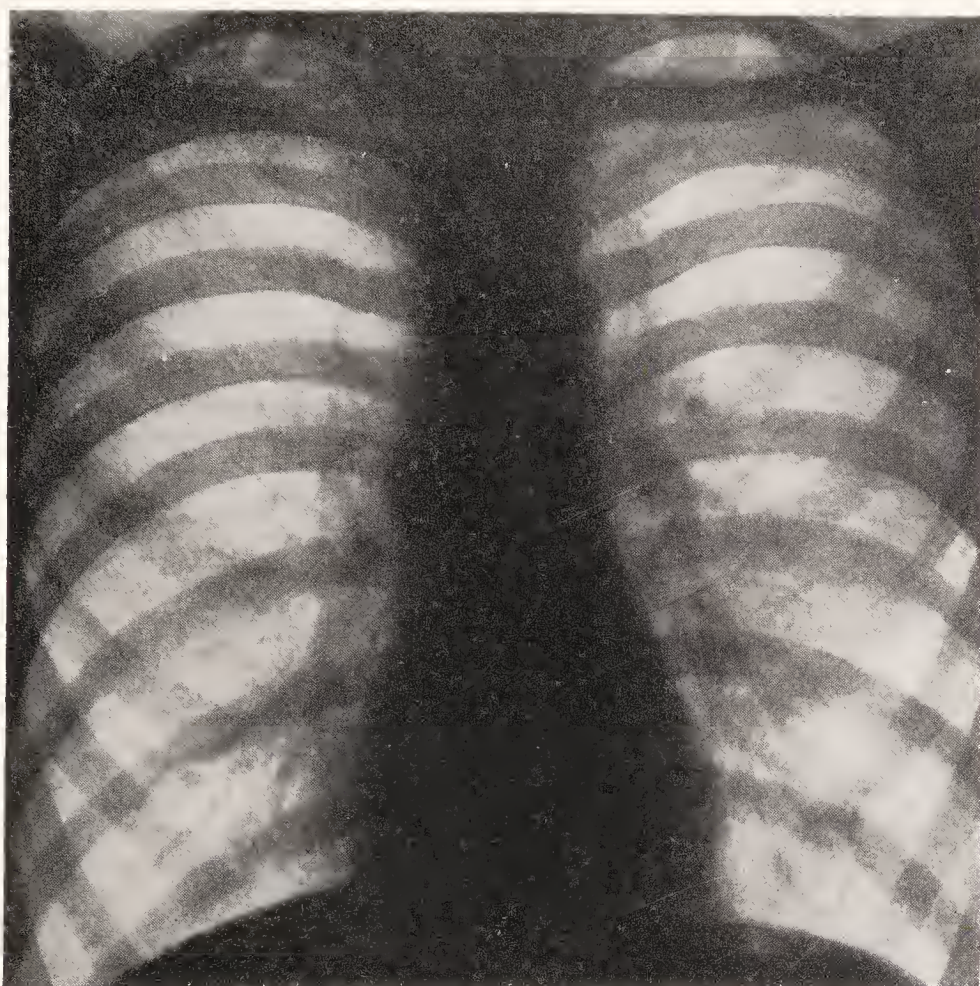
Silicosis is not an acute problem in Lancashire. Relatively few workpeople are engaged in industries where there is danger of exposure to silica dust. But there is, nevertheless, a sufficient proportion of cases found at the dispensaries to indicate that in Lancashire, as elsewhere, the inhalation of silica dust helps to swell the death-rate from tuberculosis.

As the chest symptoms of silicosis alone may suggest the presence of tuberculosis, it is natural that pure silicosis cases should occasionally be found at the dispensaries as well as cases where tuberculosis has developed in lungs that are already silicotic. The diagnosis of pure silicosis is important in that the patient may be warned of the danger confronting him, and be kept under observation for the detection of the tuberculosis that is likely to affect him sooner or later, and again, a knowledge of the condition, its pathology, and the radiographic appearances typical of it, is essential in the cases where the tuberculosis officer is confronted with the question as to whether tuberculosis has supervened.

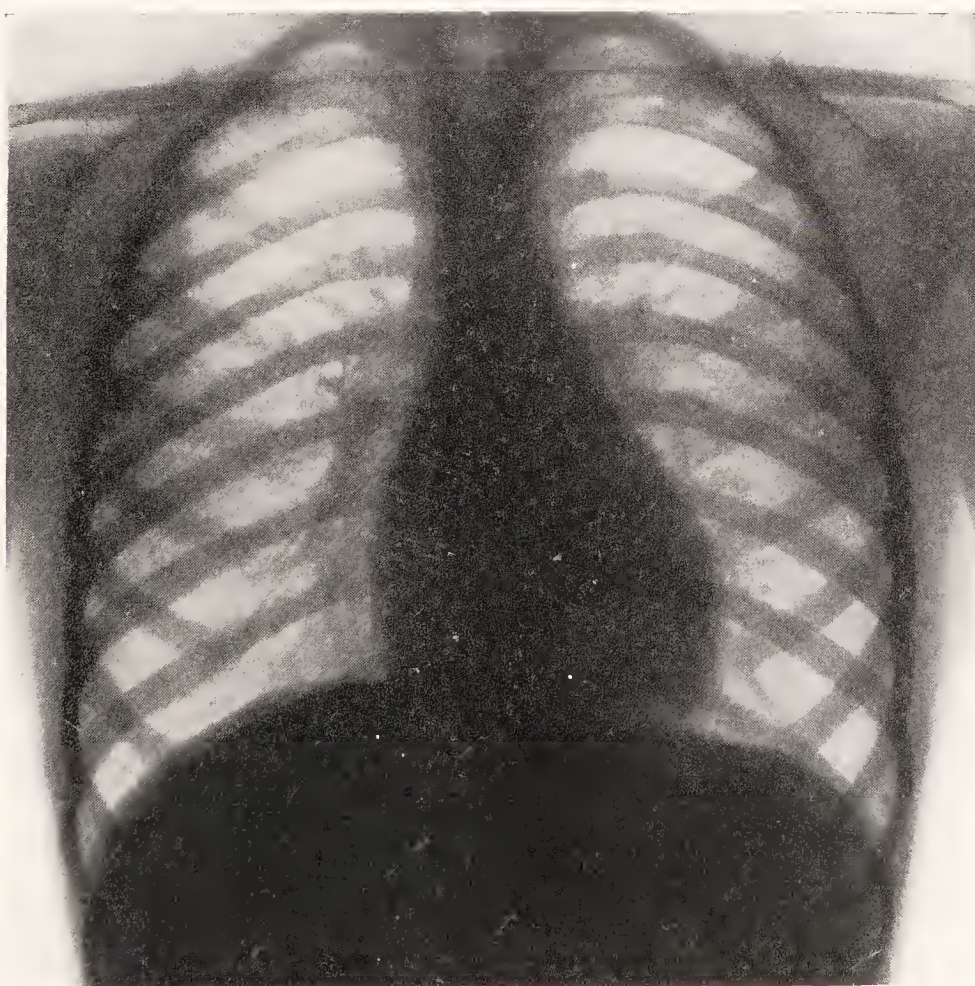
A group of skiagrams is shown in this chapter to illustrate the various appearances of silicosis and the combination of that condition with tuberculosis, together with a few skiagrams of other conditions that are of some interest in themselves and for comparison with the pictures of silicosis. It should be stated here that reduced prints are not very satisfactory in showing the fine details that are well seen in the transparent film of the skiagrams, but they will perhaps be sufficient to illustrate the main features of the condition. This applies especially to miliary tuberculosis. (Compare skiagrams Nos. 1 and 3 with Nos. 27 and 29.)

The term silicosis, in preference to others available, is used throughout, because it is now known that where fibrotic changes are brought about in lungs that have been exposed to dust, the dust must contain silica. The fibrotic changes in the lungs of the gold miner, the stonemason, the quarryman, and the coal miner are all similar, for while the other constituents of the dust may vary, it is the silica in the dust and the silica alone which gives rise to the pathological condition.





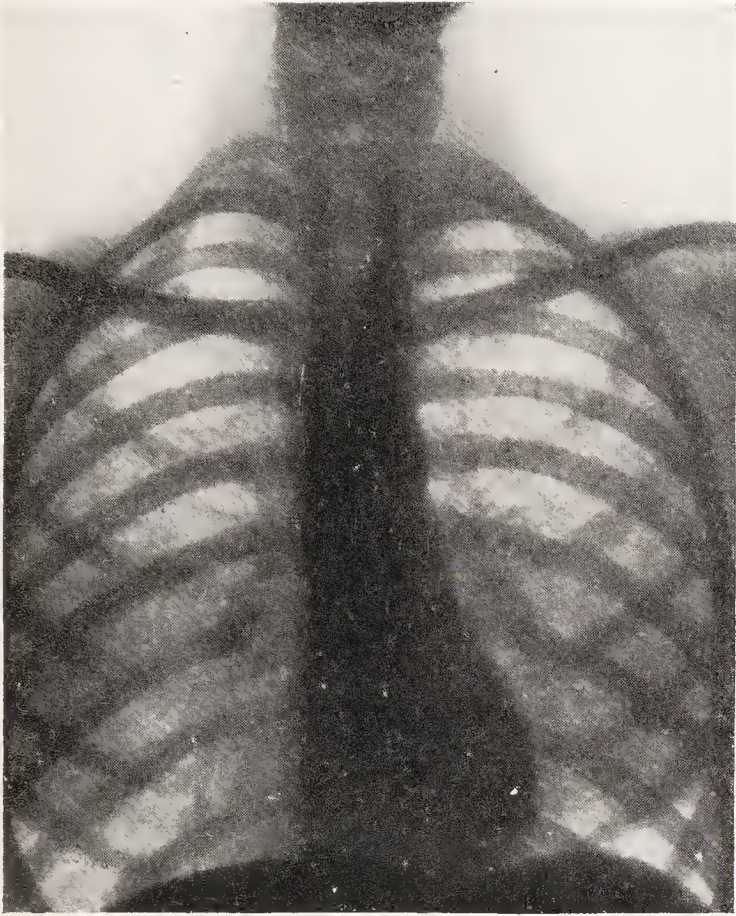
SKIAGRAM A.—Skiagram of chest of adult male, age 46 years. Living in an industrial area. No clinical or X-ray signs of disease in the chest. The root and “bronchial” shadows are not excessive, and may be regarded as “normal.”



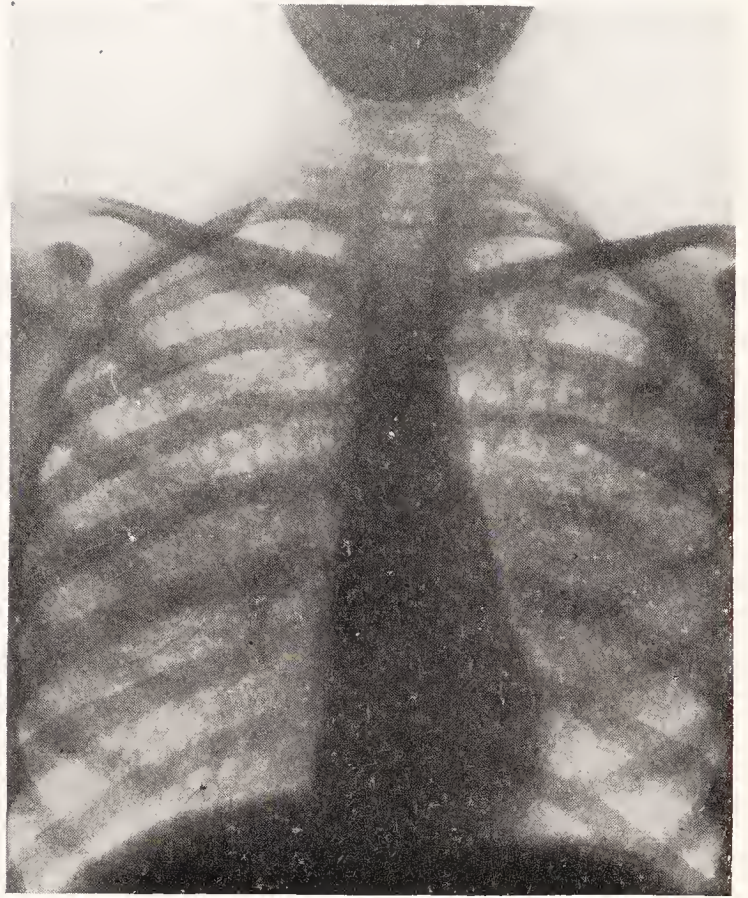
SKIAGRAM B.—Skiagram of chest of child, age 6 years, with no clinical or X-ray signs of disease in the lungs. The root and “bronchial” shadows here are fairly “normal” for a child of this age.



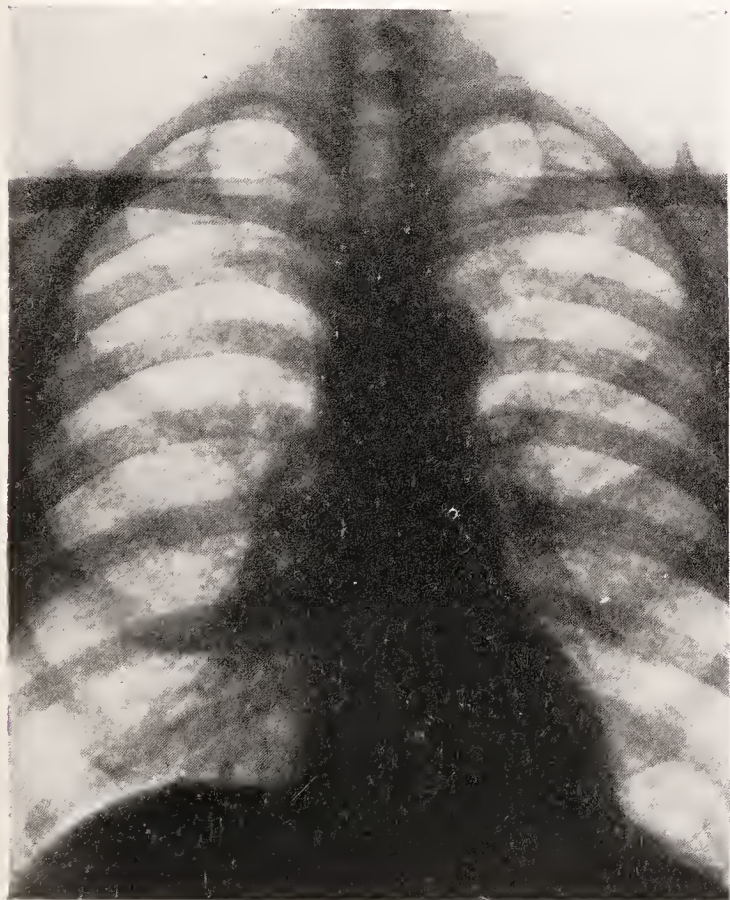




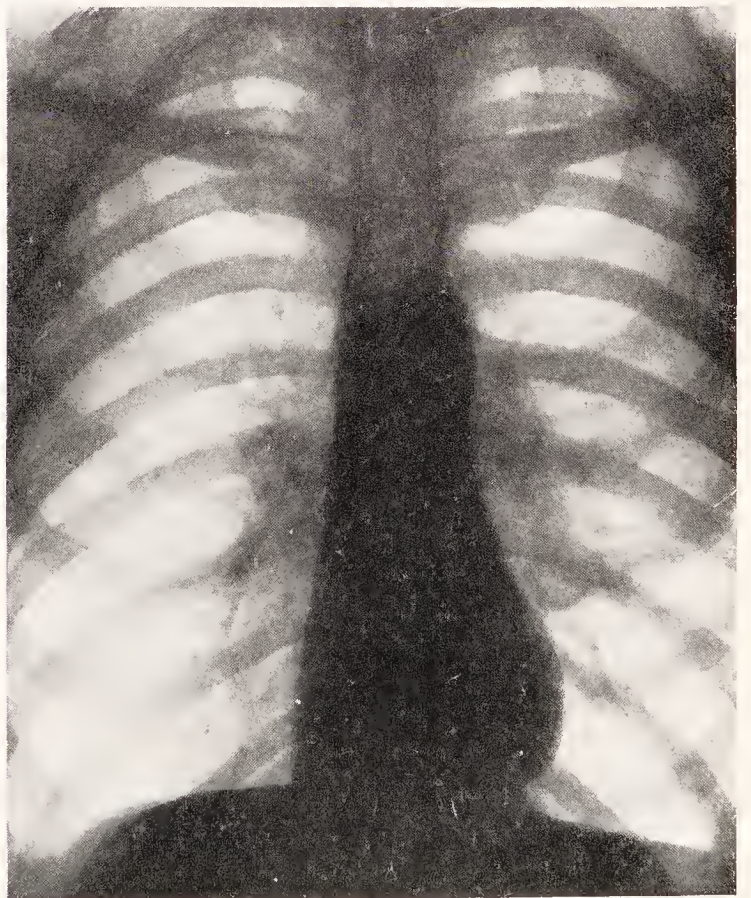
SKIAGRAM No. 1.—Acute miliary tuberculosis in female aged 16. No definite signs in the chest. No sputum was obtained for examination at any time. Referred to dispensary from a hospital with tuberculosis of ankle joint. Chest X-rayed as a routine measure. Fine mottling uniformly distributed throughout both lungs. Heart vertical. [See Skiagram No. 27.]



SKIAGRAM No. 2.—Skiagram of same patient taken 7 weeks afterwards in hospital. The mottling is now coarser in quality, but still soft and uniformly distributed over the lung fields. She died 3 weeks after this skiagram was taken, with symptoms of meningitis.



SKIAGRAM No. 3.—Acute miliary tuberculosis in male aged 43. Symptoms—cough, shortness of breath, and loss of weight. Duration of symptoms, 5 weeks. No definite signs in the chest. Died 5 weeks after skiagram was taken. Some sputum was obtained towards the end of his illness, and tubercle bacilli were found to be present. He had been a coal miner for 22 years, and possibly there was a slight degree of silicosis in the chest. The mottling in the skiagram, and its distribution, is similar to that in case No. 1, but the root shadows in this case are massive, and there is thickening of the trunk shadows in the vicinity of the roots. [See Skiagram No. 29.]

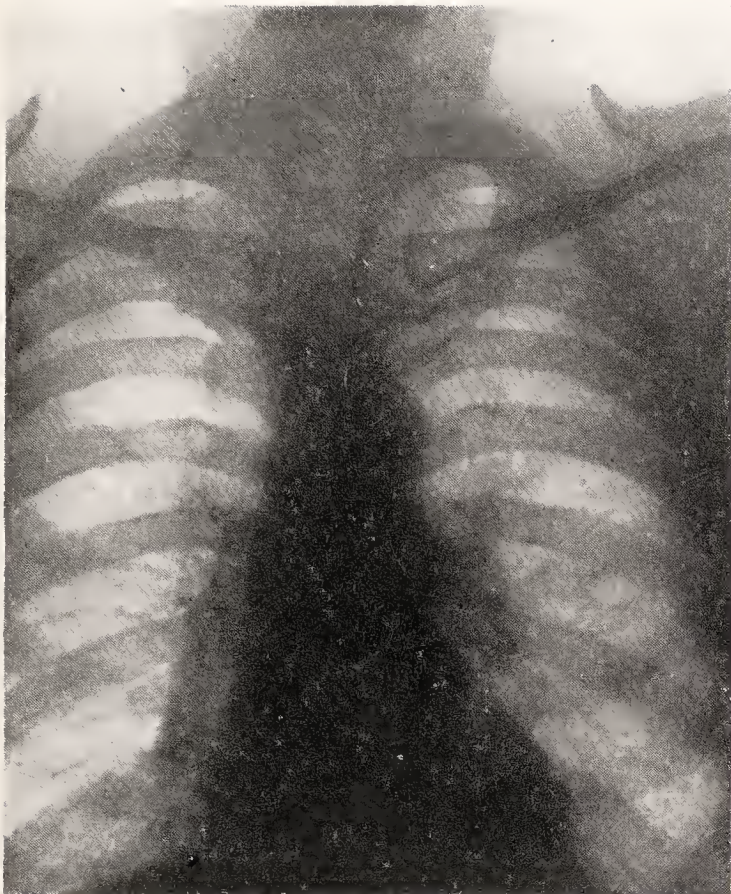


SKIAGRAM No. 4.—Male aged 38. Occupation—Carder in cotton mill for 25 years. Symptoms of asthma and bronchitis for several years. Sputum negative. No signs of tuberculosis found. Skiagram shows increase of the root shadows on both sides, with thickening of the trunk shadows in the vicinity. Emphysema at both bases. No indications of silicosis. The heart is vertical, a very common finding in cases of asthma as well as in cases of tuberculosis.

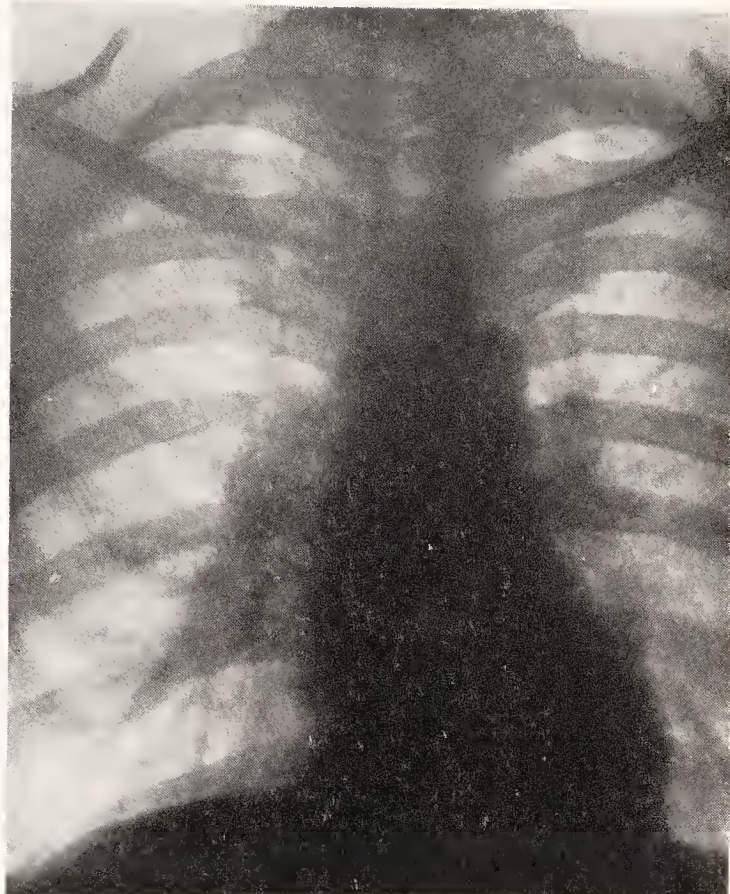








SKIAGRAM No. 5.—Male aged 46. Gold miner in South Africa for 12 years to 1914. Illness dated from 1914. Chief symptom, shortness of breath. Sputum always negative. Chest signs—air entry generally poor and expansion generally diminished. Skiagram shows considerable increase in the root shadows, with thickening of trunk shadows, and slight nodal mottling towards the bases. An early degree of silicosis. (Date of skiagram, 27/2/28).



SKIAGRAM No. 6.—Male, aged 50. Gold miner in South Africa for 11 years to 1914. Left the mines on account of silicosis. Symptoms commenced in 1914 with dyspnoea. Sputum always negative. Chest signs—considerably diminished chest expansion and poor air entry generally. Skiagram shows great increase in the root shadows and marked thickening of the adjacent trunk shadows, with a fair amount of nodal shadowing. Fairly early silicosis somewhat more advanced than case No. 5. (Date of skiagram, 30/5/27).



SKIAGRAM No. 7.—Male aged 72. Gold miner in South Africa for 11 years until 1919. Left the mines owing to silicosis. Symptoms commenced with shortness of breath, 1916. Sputum negative. Chest signs consisted of poor air entry and poor expansion generally. Skiagram shows increased root shadows and considerable thickening of trunk shadows throughout both lungs. Well marked nodal shadowing with tendency to form larger areas of fibrosis. A more advanced state of silicosis than the preceding cases. (Date of skiagram, 7/1/26).



SKIAGRAM No. 8.—Male aged 51. Gold miner in South Africa for 8 years to 1913. Left mines on account of silicosis. Symptoms commenced in 1913 with cough and shortness of breath. Sputum always negative. Chest signs consisted of weak breath sounds all over, and generally poor expansion. Skiagram shows a nodular fibrosis throughout the whole of both lungs, with one area of massive fibrosis in the right lower zone. Root shadows are still massive with thickened trunk shadows. The appearances are mostly those of the second stage of silicosis, except for the massive fibrosis in the right lower zone, which is said to be typical of the third stage. (Date of skiagram, 23/5/28).





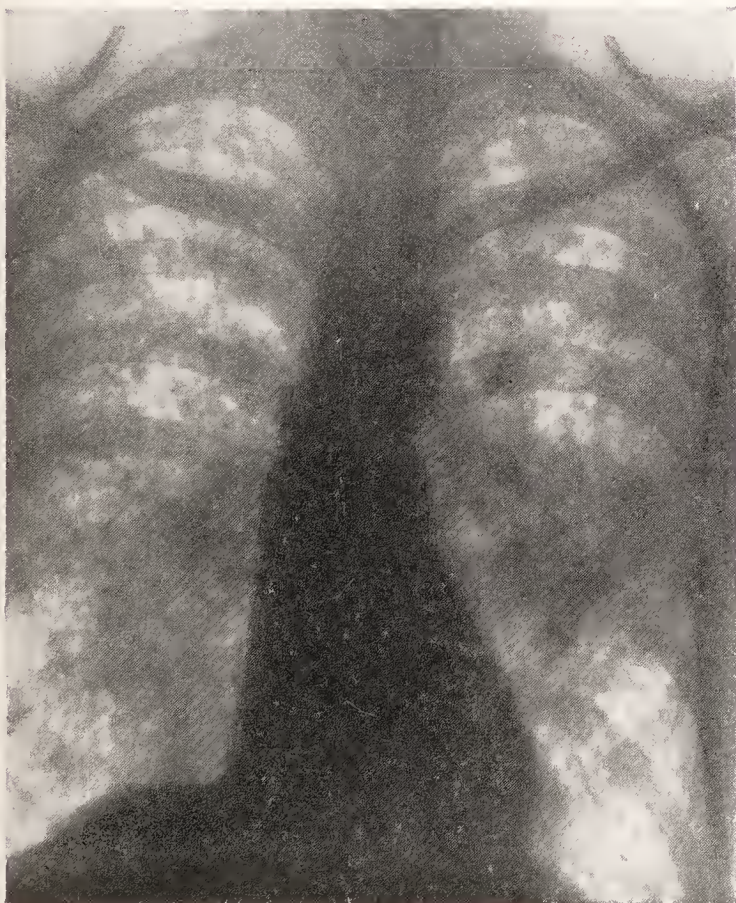




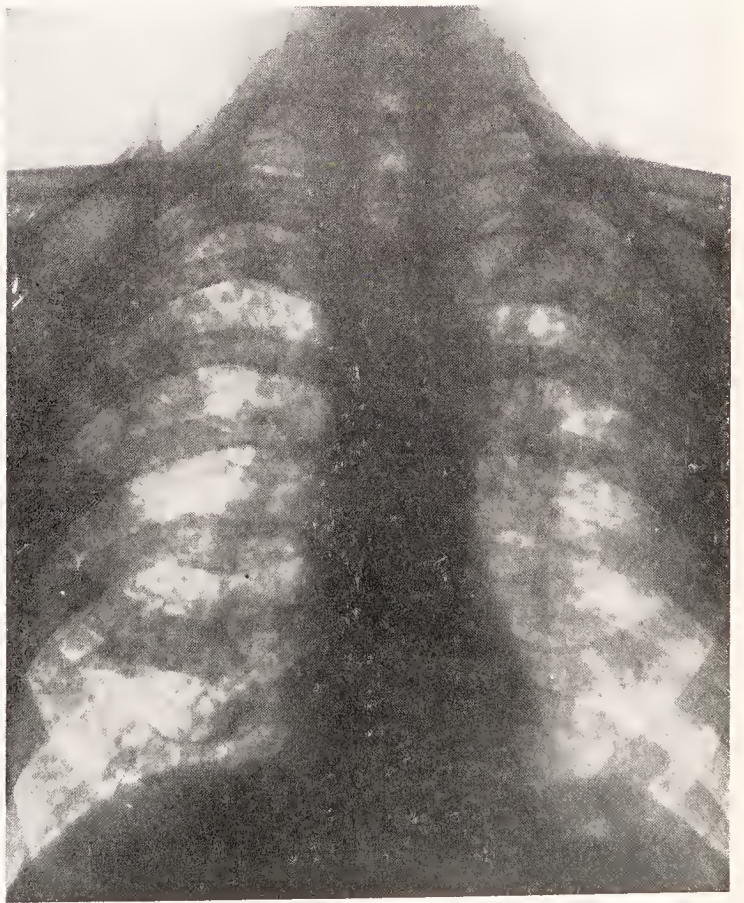
SKIAGRAM No. 9.—Male aged 72. Gold miner in South Africa for 9 years until 1902. Left the mines owing to silicosis. Sputum always negative. Chest signs—generally diminished expansion with poor air entry all over. Skiagram shows a diffuse nodular fibrosis and areas of massive fibrosis situated chiefly in the upper zones of both lungs. Right diaphragm peaked. Indications of mediastinal pleurisy on the right side. The distribution of the fibrosis in this case is very suggestive of tubercle, but no tubercle bacilli have been found in the sputum. The heart is tending to become vertical. (Date of skiagram, 19/3/27).



SKIAGRAM No. 10.—Male aged 55. Gold miner in South Africa for 19 years until 1914. Left the mines owing to silicosis. Symptoms commenced in 1913 with shortness of breath. Sputum always negative. Examination of chest showed the usual diminution of expansion and weakness of breath sounds all over. Skiagram shows areas of massive fibrosis throughout the middle and lower zones of both lungs. Emphysema of the apices. Advanced silicosis with probably super-imposed infection. (Date of skiagram, 23/12/25).



SKIAGRAM No. 11.—Male aged 56. Collier for over 30 years. Symptoms—cough and shortness of breath for 2 years. Sputum always negative. Chest signs—crepitations all over the left lung and also at the right base. Percussion note impaired generally. Family history of tuberculosis. Skiagram shows a diffuse nodular fibrosis throughout both lungs, with areas of massive fibrosis in the vicinity of the left root. Heart not vertical. The skiagram indicates a moderately advanced silicosis. (Date of skiagram, 2/11/25).



SKIAGRAM No. 12.—Male aged 52. Stonemason for over 20 years. Symptoms—cough and shortness of breath. Chest signs indefinite. Weakness of r.m. especially over the right lung. No sputum has been obtained at any time for examination. Skiagram shows a nodular fibrosis throughout the whole of both lungs. Heart vertical. The nodular shadows are becoming larger in both upper zones. (Date of skiagram, 20/8/28).

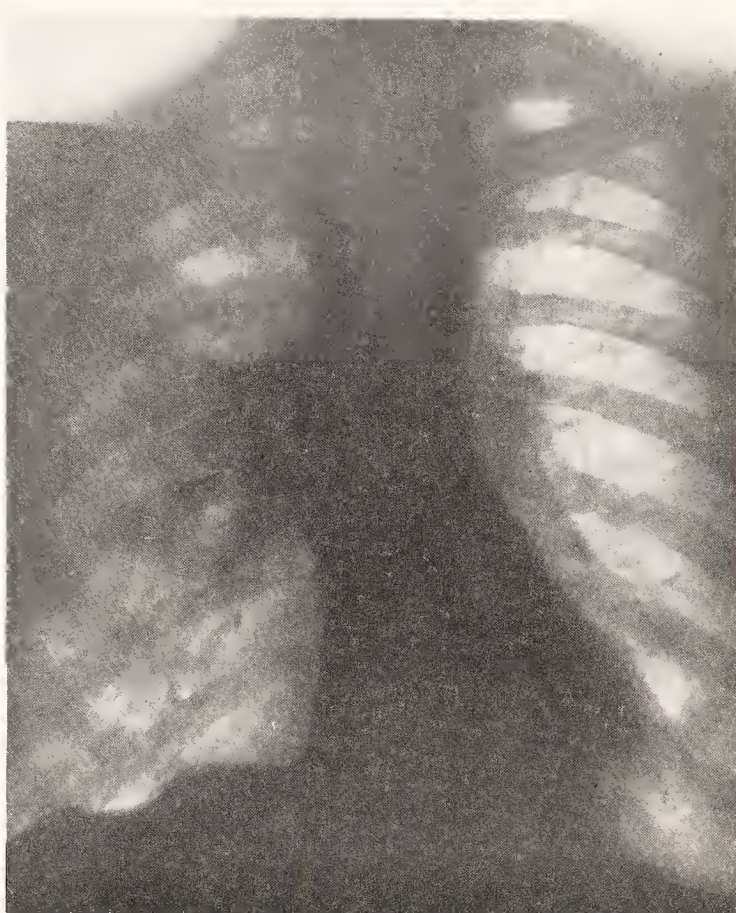




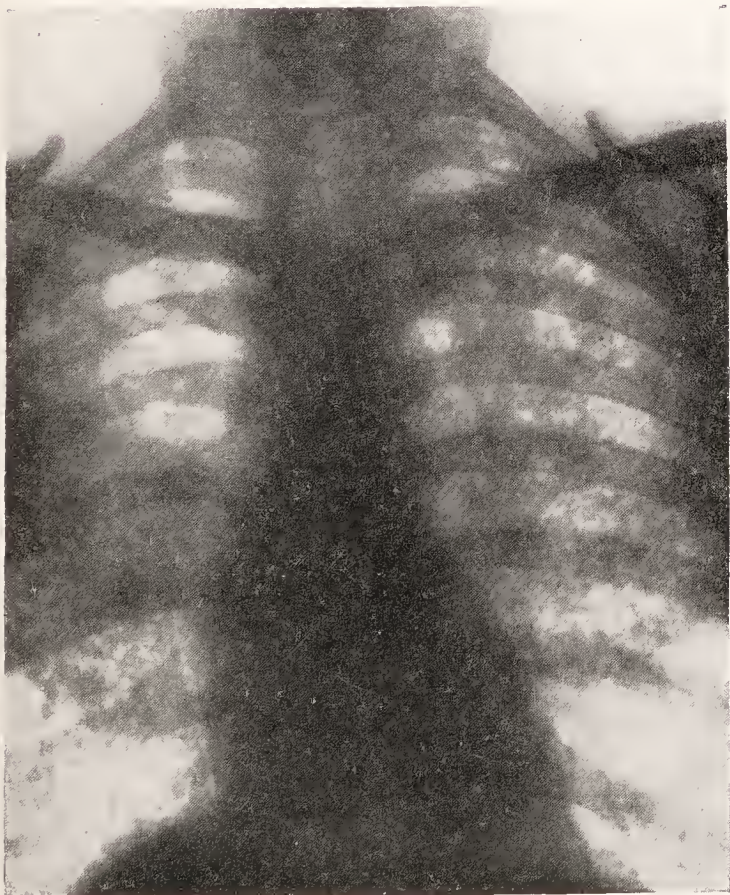




SKIAGRAM No. 13.—Male aged 48. Coal miner for 30 years. Duration of symptoms, 5 years. Cough and shortness of breath. Chest signs indefinite. Poor expansion and general weakness of r.m. Sputum always negative. Skiagram shows nodular and massive fibrosis throughout both lungs. Advanced silicosis. Tuberculosis cannot be excluded from skiagram, but tubercle bacilli have never been found in the sputum. The aorta is very prominent. Wassermann negative. (Date of skiagram, 8/11/26).



No. 14.—Male aged 63. Coal miner for 40 years. Symptoms—cough and shortness of breath dating back a few years. No previous chest illnesses. Never had pneumonia. Chest signs consist of dullness and coarse two-phase creps. over right lung with weakness of r.m. Sputum negative after 23 examinations. Skiagram shows a diffuse fibrosis in right lung with massive shadowing near root. Root shadows excessive, and in left lung there is thickening of the trunk shadows. Outline of right diaphragm irregular. Malignant disease, syphilis, and tubercle have been excluded in this case after clinical observation, and apparently condition is mainly a silicosis affecting right lung to a much greater degree than left. (Skiagram, 12/7/28).



SKIAGRAM No. 15. Male aged 49. Gold miner in South Africa for 5 years until 1913. Left mines on account of silicosis. He had the usual symptoms which commenced in 1913. Sputum negative 1926. Positive in March, 1928. Skiagram shows a diffuse nodular fibrosis in both lungs, with area of massive shadowing in the mid zone of the right lung. There is an increase in the deposits in the left upper zone with marked thickening of the trunk shadows downwards to the root. The appearances in the upper half of the left lung strongly suggest that a tuberculous lesion has developed in addition to the silicosis. (Date of skiagram, 27/3/28).



No. 16. Male aged 58. Gold miner in S. Africa 9 years until 1914. Chest symptoms commenced in 1914 with shortness of breath. Chest signs consisted of diminished expansion all over with crepitations over lower two-thirds of left side, back and front, and a few crepitations at right base. Sputum negative in 1925 and 1926, but found positive in November, 1927. When seen in 1927, symptoms were much the same as in 1925 and 1926, with the exception that patient had lost 14 lbs. in weight. Skiagram shows advanced silicosis but in addition there is definite cavitation in middle and lower zones of left lung with massive fibrosis. (Skiagram, 8/5/28).









SKIAGRAM No. 17.—Male aged 46. Stone quarryman for 20 years. Duration of chest symptoms, 6 years. Cough, sputum, and dyspnoea. Signs in the lungs indefinite. Sputum positive June, 1925. Patient died August, 1927. Skiagram shows fine nodular fibrosis throughout the whole of both lungs, with diffuse haziness. There is also a large annular shadow in the right upper zone, probably due to cavitation. Heart of the vertical type. Moderately advanced silicosis plus tuberculosis. (Date of skiagram, 22/6/25).



No. 18.—Male aged 49. Stonemason for 29 years. Patient gave duration of his symptoms, cough, sputum, and shortness of breath as 3 months. Twenty years ago he had "congestion of lungs." Then kept well till present illness commenced. Sputum positive 29/6/28. Skiagram shows massive rounded shadows of calcareous density in upper half of both lungs. The root shadows are excessive and trunk shadows are accentuated with some nodular mottling in lower zones. The skiagram appearances indicate old healed tuberculous lesions and a slight degree of silicosis. This case is interesting in that sputum is positive and chest symptoms of recent date. The healed lesions shown in skiagram must date back for many years, and his present illness, with positive sputum, must be due to a recrudescence of the old disease, or possibly a reinfection, the silicosis acting as a predisposing agent. (Skiagram, 11/6/28).



SKIAGRAM No. 19.—Male aged 48. Gold miner in South Africa. Left the mines in 1919 owing to silicosis. Chest symptoms commenced August, 1922. Sputum positive. Skiagram shows dense shadowing of the whole of the left side of the chest, with heart, mediastinum, and trachea displaced to the left. On the right side there are indications of a nodular fibrosis over the whole lung. Skiagram indicates moderately advanced silicosis in right lung. The appearance of the left side indicates superimposed infection, the nature of which is settled by the sputum result. (Date of skiagram, 5/5/28).

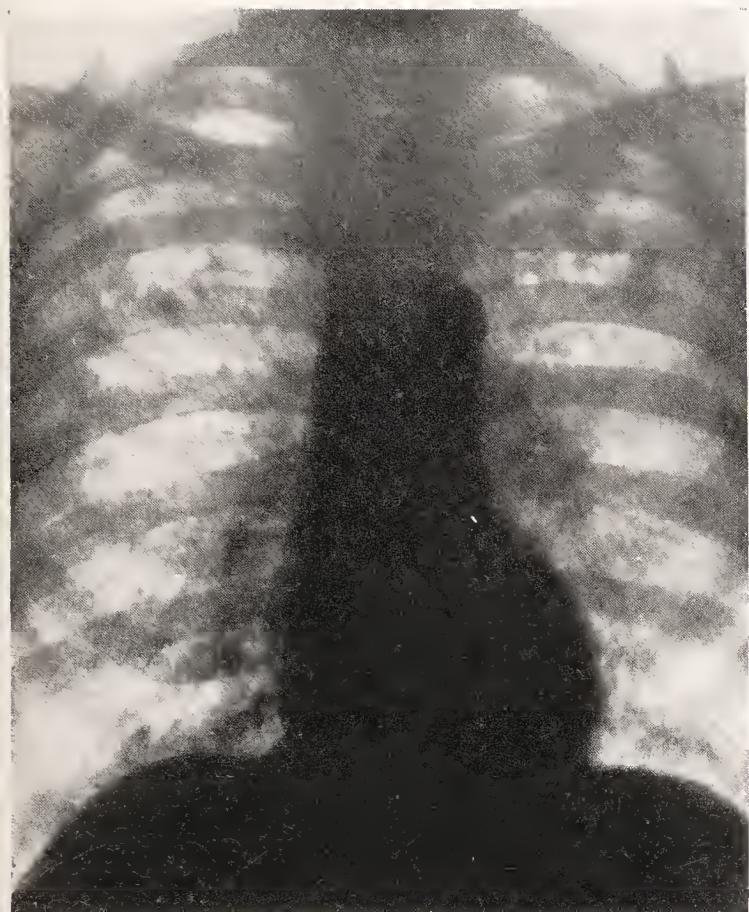


No. 20.—Male aged 62. Stonemason for 50 years. Recently had an acute illness which his doctor stated was clinically a broncho-pneumonia. Sputum has been examined on 7 occasions with a negative result. Skiagram shows dense shadowing of the upper two-thirds of the left side with some displacement of heart and mediastinum to the left. On the right side the skiagram shows a nodular fibrosis involving the whole lung. Moderately advanced silicosis is present, and the appearance on the left side again indicates an infection of some kind in this case, probably pneumococcal, in view of the recent illness and the negative sputum results. (Date of skiagram, 14/8/28).





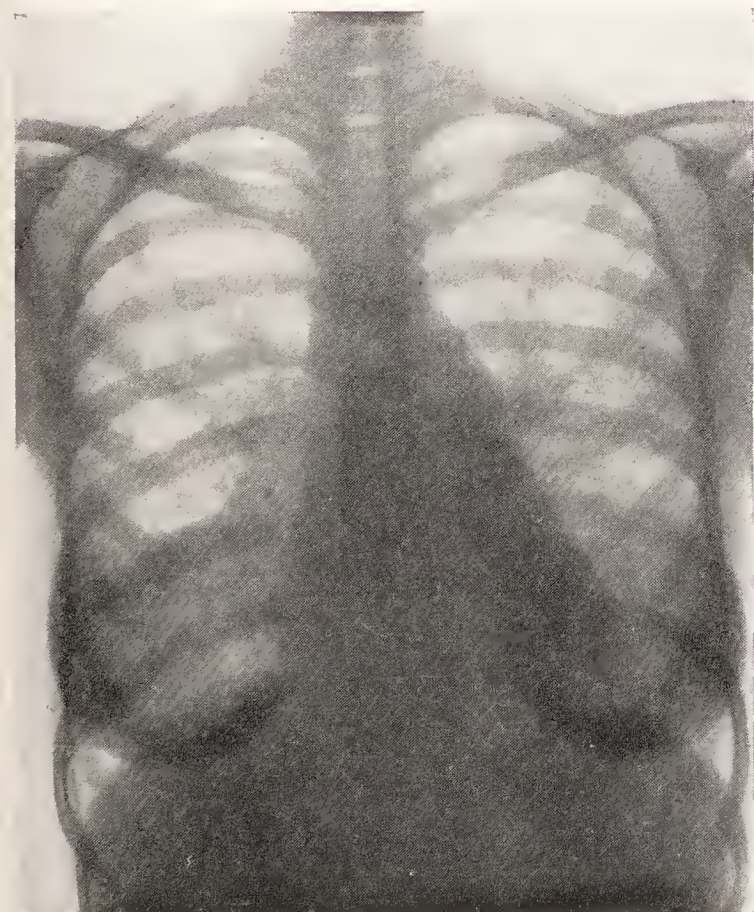




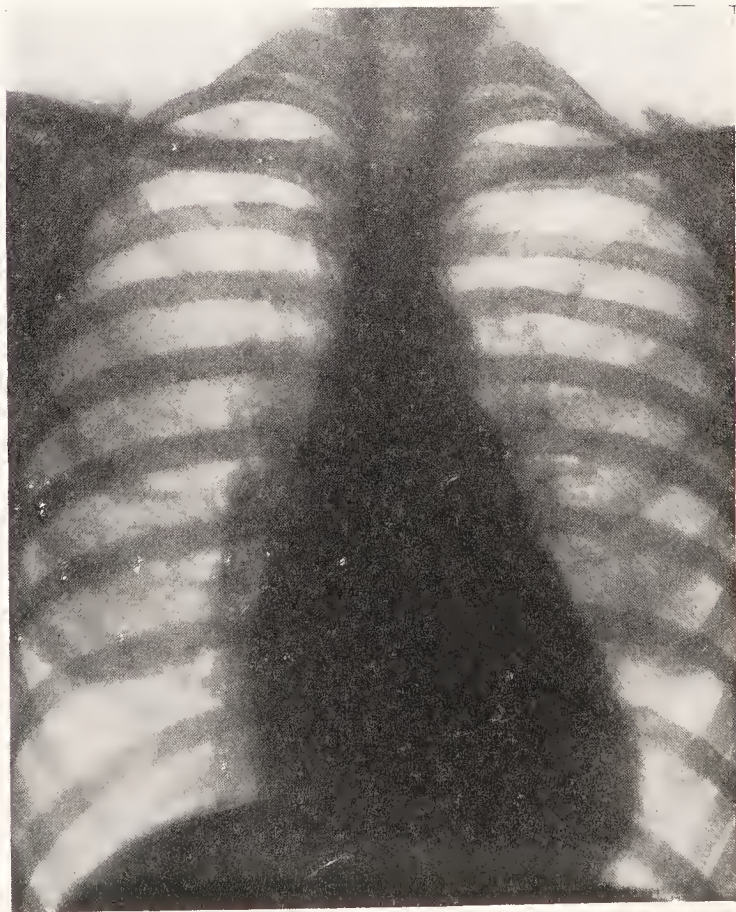
SKIAGRAM No. 21. Male aged 42. Brewer's drayman. In 1920 had active disease in both upper lobes. Skiagram 1/5/28 (eight years afterwards), shows coarse nodules of calcareous density in the upper half of both lungs. Root shadows excessive with thickening of trunk shadows. Sputum positive each year until 1926. Negative during last two years. To show the typical distribution of the mottling in bi-lateral tuberculosis where no silicosis is present.



SKIAGRAM No. 22.—Male aged 36. Acute pulmonary tuberculosis of the broncho-pneumonic type. Died four weeks after skiagram was taken. Sputum positive. Occupation outdoor labourer. Had never been exposed to silica-containing dust of any kind. For comparison with previous skiagrams.



SKIAGRAM No. 23.—Case of mitral stenosis to show the increased root shadows and thickened trunk shadows due to passive congestion.



SKIAGRAM No. 24.—Another case of mitral disease showing again the accentuated root shadows with thickened trunk shadows similar to the appearances seen in early silicosis.

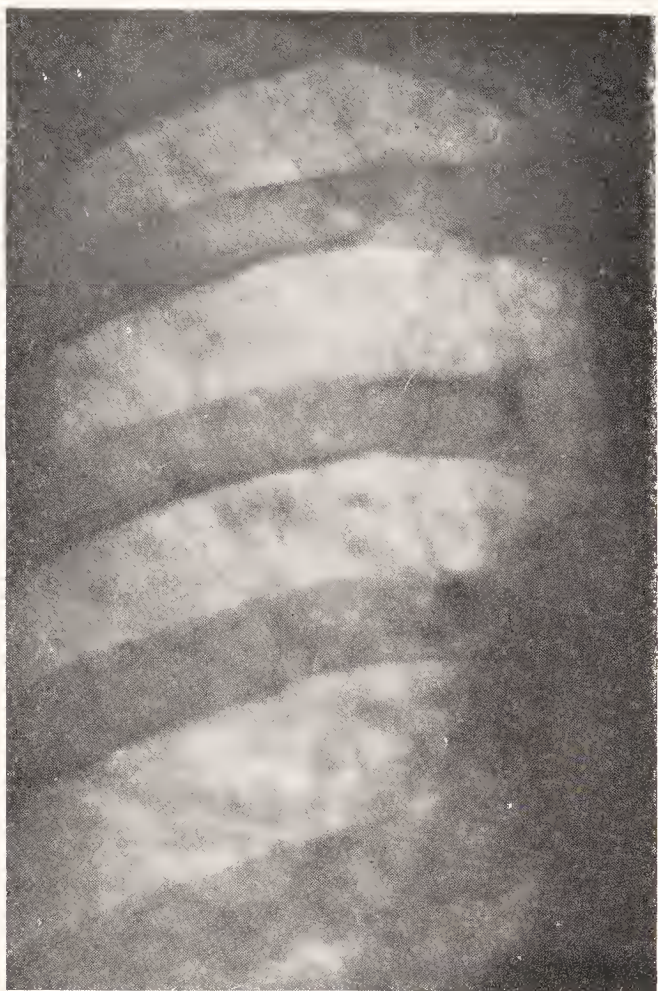








SKIAGRAM No. 25.—Portion of “normal” lung to show density and thickness of the trunk shadows.



SKIAGRAM No. 26.—Skiagram of portion of chest of coal miner with early silicosis. Thickening of trunk shadows with slight nodular fibrosis.



SKIAGRAM No. 27.—Portion of lung with acute miliary tuberculosis. Same case as No. 1.



SKIAGRAM No. 28.—The same portion of lung 7 weeks afterwards, showing the increase in the number and size of the tubercles.









SKIAGRAM No. 29.—Portion of lung showing acute miliary tuberculosis in a coal miner. Same case as No. 3.



SKIAGRAM No. 30. Skiagram of portion of lung of coal miner with nodular silicosis. Same case as No. 11.



SKIAGRAM No. 31.—Skiagram of portion of lung of gold miner with nodular silicosis. Same case as No. 8.





It is known also that the silica must be chemically in the free state and not combined. It has also been proved that the action of the dust in the lungs is not a mechanical one, due to sharp points and edges of the particles, as was formerly supposed. The particles of dust which are harmful are those which are microscopic in size, not greater than 10 to 12 microns in diameter.

Research in various parts of the world has now made clear the pathology of silicosis, and it is essential in interpreting the X-ray appearances of the condition that the pathological processes should be kept in mind and correlated as far as possible.

The first step in the process is the entrance of fine silica dust into the alveoli of the lungs. Certain cells of doubtful origin, but probably endothelial, then proliferate, and some of these cells incorporate the dust particles and carry them onwards into the lymphatic system of the lungs. They are known as "dust" cells. At first these cells have a clear path along the lymphatics of the lung, and they are able finally to reach the tracheo-bronchial group of glands at the root of the lung. These glands then enlarge and become fibrotic. If dust inhalation goes on, the lymphatic channels in the lung tend to become blocked, and the dust cells collect in pseudo-tubercles at the small nodes or glands at the branching of the bronchi and bronchioles. This constitutes the early stage of silicosis, and the corresponding X-ray appearances are (*a*) enlargement of the root shadows due to the increase in size of the glands, (*b*) thickening of the trunk shadows, together with increase in the linear markings towards the periphery of the lungs (see skiagrams 5, 6, 7). It should be noted that the skiagram appearances in this stage are similar to those seen in other conditions, e.g. chronic bronchitis, and the passive congestion of cardiac valvular disease (see skiagrams 4, 23, 24). In city-dwelling adults, root and trunk shadows vary very considerably from the normal, and an increase in root and trunk shadows may be quite compatible with ordinary health and the absence of silicosis.

With continued stasis of the lymphatic circulation in the lungs, the dust cells go on accumulating in the small glands at the bifurcations, and these glands become larger and develop into fibrous nodules of varying size. These nodules become large enough to be visible in the skiagram and give rise to the typical nodular mottling of the intermediate or second stage of silicosis. The skiagram of silicosis at this stage is a very characteristic one (see skiagrams 8, 11, 12).

If the silicosis progresses, the next stage is that of a general fibrosis, varying in different parts of the lung, and with more or less of the early changes still present. The changes are brought about by coalescence of the smaller nodules and also by interstitial fibrosis. Large irregular areas of consolidation may also be found, and pleural thickening with fixation of the diaphragm is often also a feature of this stage.

The skiagrams at this stage show a coarser type of mottling due to the larger nodules, and also larger shadowed areas, some cloudy and others of considerable density, with appearances characteristic of the earlier stages still present in varying degree (see skiagrams 9, 10, 11, 13, 16, 19). The large areas of dense fibrosis have been the subject of considerable discussion. Many observers believe that they are the result always of a superimposed infection, usually tuberculous, but occasionally pneumococcal or streptococcal (see skiagram 20).

In all three stages, the skiagram appearances, together with the evidence of exposure to dust and the clinical symptoms and signs, provide sufficient information for arriving at a diagnosis of silicosis, and determining also the stage which the process has reached. It should be noted, however, that as in most systems of classification, there is no definite boundary between one stage of silicosis and another, and in most skiagrams all that can be said is that the signs of one stage predominate, indications of earlier or later stages being present in lesser degree.

Difficulties arise when the question is not merely one of diagnosing silicosis, but also of determining the presence or absence of tuberculosis, a question that always arises when such a patient is sent to a tuberculosis dispensary. It should be said at once that the one certain finding is the presence of tubercle bacilli in the sputum, and in advanced silicosis this is usually the evidence relied upon, although it is known that many cases of silicosis with tuberculosis proceed to a fatal issue without tubercle bacilli ever having been found in the sputum. Tuberculosis does not develop so often in the early stages of silicosis as in the later, and when it does, it is said usually to assume one of the acute forms of the disease, e.g. acute miliary tuberculosis, or acute tuberculous broncho-pneumonia. Case No. 3 probably illustrates this point. The radiographic evidence of superimposed tuberculosis at this stage is of the same importance as in the diagnosis of ordinary forms of tuberculosis, as the lung fields are fairly clear and no silicotic mottling has yet developed.



In the second stage, that of nodular fibrosis, the widespread changes due to silicosis as seen in the skiagram are apt to conceal the evidence of a tuberculous lesion that would show itself in an uncomplicated case, and the result of the sputum examination has often to be depended on with other clinical evidence that may be of great importance, e.g. sudden loss of weight in a patient who has for some time had the symptoms of ordinary silicosis without impairment of general condition. Sometimes, however, it is possible in the skiagram to detect changes that are strongly suggestive of superimposed tuberculosis (see skiagram No. 15).

These remarks also apply to the advanced stage of silicosis. It should be remembered here that all cases of progressive silicosis tend to become tuberculous, and that the massive fibrosis which is typical of the third stage of silicosis is now generally accepted to be due to superimposed infection, usually tuberculous, but sometimes pneumococcal or streptococcal. Occasionally in these advanced cases, there is evidence in the skiagram that a process other than silicosis has appeared. Evidence of cavitation in a skiagram, for example, would be diagnostic (see skiagrams 16, 17), and so also would areas of calcification in the lung fields (see skiagram 18).

A skiagram of a cardroom worker's chest is shown in the series (No. 4) to illustrate the fact that organic dust such as cotton does not produce silicosis, but it can in some cases give rise to other chest affections such as bronchitis and asthma.

Coal mining is one of Lancashire's staple industries, and in certain areas of the County large numbers of coal miners are examined at the dispensaries. Occasionally, as shown by the skiagrams, coal miners are found to have simple silicosis. Among the coal miners who are found to have pulmonary tuberculosis, the majority of the cases are uncomplicated by silicosis. The silicosis of coal miners, as Dr. Tattersall has shown, is contracted by miners who sink shafts and cut underground roads through sandstone and similar rocks containing silica, and the skiagrams of these miners present appearances similar to those found in gold miners (see skiagrams 11, 13 and 14).

Mavrogordato showed that simultaneous exposure to coal and silica dusts created a condition which seemed to prevent the fixation of the silica, and he thinks that in coal miners the coal dust aids the lungs in dealing with the comparatively small amounts of silica present with coal by eliminating the silica.

In districts of the Administrative County of Lancaster, where the industry of coal mining predominates (i.e. not less than 40 per cent. of the occupied males being engaged in mining), the male death-rate from pulmonary tuberculosis is higher than the corresponding rate for the whole Administrative County (for 1921, 0·91 per 1,000 as against 0·82).

In connection with the question of the apparent beneficial action of coal dust, it is deserving of mention that in Derbyshire, Dr. Heffernan found that the ganister sand brick-makers had a relatively low incidence rate both of pulmonary tuberculosis and silicosis, although silica is present in the material in large amount, and he finds that this is apparently due to the fact that the sand is mixed with a small amount of clay which appears to inhibit the normal action of silica.

Nine of the skiagrams shown are of gold miners from South Africa who, after developing silicosis there, have returned to their original homes in Lancashire. In the gold mines of South Africa, silicosis and tuberculosis constitute an urgent problem which is being gradually solved owing to the very efficient and thorough measures that are being taken. All who present themselves for employment in the mines are examined in order to exclude as far as possible all tuberculous or potentially tuberculous individuals. It is interesting to note that the Medical Bureau at Johannesburg now refuses for employment all persons whose heart shadow on the skiagram is of the asthenic or vertical type, shaped like a narrow vertical cylinder. These persons are usually of poor physique, and experience has taught that they are usually liable to develop both silicosis and tuberculosis. It is said that as simple silicosis develops, the normal heart shadow tends to change to the vertical, although the change is not so striking as that which occurs in pulmonary tuberculosis.

Half-yearly routine examinations are made of all persons employed in the mines. Any workers found with signs of silicosis or tuberculosis are eligible for compensation. Those with tuberculosis are discharged from the mines; the silicotic men have the option of remaining at work or accepting compensation.

It has been made clear in South Africa that silicosis predisposes to tuberculosis, and also that tuberculous infection on the other hand hastens the silicotic process. Silicosis, alone, is therefore much less serious than when complicated by tuberculosis, and similarly tuberculosis is less serious when silicosis is absent.

The practical outcome of this experience, so far as tuberculosis is concerned, is that no person with tuberculosis or suspected of having the disease should take up an occupation where he will be exposed



to the inhalation of silica dust, and this for two reasons, the danger to himself and the danger to his fellow workers who so far may be free from tuberculosis.

That the preventive work in South Africa has been successful may be judged by the figures given in the Eighth Report of the South Africa Phthisis Miners' Bureau for the year ending 31st July, 1924. It is stated that among 6,132 Europeans engaged since 1916, only 7 cases have contracted silicosis, and only 12 simple tuberculosis. The rate of incidence for cases of tuberculosis with silicosis was 1·6 per thousand as compared with 8·0 before 1919-20.

Dr. Pask has contributed the following short note regarding gold miners in the Furness district :—

“In the Furness area a considerable number of men have at different times left the district for South Africa to work on the Rand in the gold mines, attracted by the high rate of wages. Practically all these men have found employment underground in a dusty atmosphere, and quite a large number of them have returned with silicosis.

“The number of cases contracting pulmonary tuberculosis is not so large as one might suppose ; out of a series of 23 consecutive patients examined, with definite silicosis, only one was found to be suffering from pulmonary tuberculosis. The same group after several years would, however, almost certainly show a higher proportion of tuberculosis than this.

“The diagnosis of pulmonary tuberculosis in persons suffering from silicosis presents some difficulty, and in the absence of any gross lesion in the chest suggesting breaking down of the lung tissue, I consider the examination of the sputum the most important factor in arriving at a definite diagnosis. In a large number of cases the skiagram does not afford a great deal of help in coming to the conclusion as to whether the case is one of pulmonary tuberculosis super-added to the gold miner's silicosis. In early cases the mottling is of a fine texture whereas in advanced cases the mottling tends to become coarser with considerable enlargement of the bronchial glands. Haemoptysis is frequently a symptom complained of in pure silicosis cases. Patients with pure silicosis as a rule do not lose much weight, in fact it is a common experience to find that they put on weight.

“The type of tuberculosis met with in silicosis cases appears to take much the same course as cases of ordinary pulmonary tuberculosis, although one occasionally meets patients with old-standing silicosis with a negative sputum for years suddenly changing to a positive sputum with a rapid fatal termination. On the other hand, the disease in a number of instances takes on a very chronic character.”

The skiagrams reproduced in this chapter were taken by the consultant tuberculosis officers shown hereunder :—

Nos. 1, 3, 4, 11, 12, 13, 14, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 29, and 30, by Dr. J. L. Stewart at the Ashton-under-Lyne Chief Dispensary (Area No. 3).

Nos. 2 and 28 by Dr. C. W. Laird at the Rufford Pulmonary Hospital.

Nos. 5, 6, 7, 8, 9, 10, 15, 16, 19, and 31, by Dr. E. H. A. Pask, at the High Carley Sanatorium.

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## VI.—RESEARCH WORK AND NEW METHODS OF TREATMENT.

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The County Council have adopted the policy of encouraging the tuberculosis medical staff, in addition to their ordinary duties, to engage in research work, and to give trials to the various new methods of treatment of the disease which are, from time to time, recommended as cures for tuberculosis, provided, of course, that there are one or more patients prepared voluntarily to co-operate in the experimental work. The Council have voted a sum of £200 per annum for research work during the past few years.

### *Research.*

In the reports for 1924 and 1925, I enumerated nine main subjects into which the whole or one or other of the medical staff had carried or were carrying out original research. Several subjects are still being followed up, namely (1) the fate of young children in tuberculous households; (2) the circumstances attending non-notification and late notification of cases of tuberculosis; (3) the proportion of cases diagnosed in the first place by X-ray examination alone, and eventually confirmed by clinical findings. In the present year, research is also being undertaken on (4) the high prevalence of tuberculosis in the Furness Sub-Area. This makes altogether ten subjects upon which research has been or is being carried out.

With regard to No. (1) "the fate of young children in tuberculous households," the Joint Tuberculosis Council of England and Wales invited the "Lancashire group" of tuberculosis officers to undertake research on this important subject. The Council appointed me convener of a committee to deal with the research. The County tuberculosis medical staff, together with the tuberculosis officers of eleven of the Lancashire County Boroughs, undertook to furnish in numbers roughly according to population full particulars of tuberculous households. Altogether forms relating to 2,862 families were sent in (1,489 from County tuberculosis officers and 1,373 from County Borough tuberculosis officers) to this office. The forms have been examined and are now being classified so as to show the mortality among children born in houses where the mother, father, or other relative suffered from tuberculosis—pulmonary or non-pulmonary. When the figures are completed and comparison made with the mortality among the child population of the country, the information obtained should be of value in comparing results with the figures obtained by

Professor Calmette for France. They may also indicate how far there will be a need in this country for the "boarding out" of children born of tuberculous persons, or the need of vaccination as has been very strongly advocated by Professor Calmette.

### *New Methods of Treatment.*

New methods of treatment have been tried generally on patients at County sanatoria and hospitals, as it has been found more satisfactory to have the patients under the constant supervision, care and control of the medical superintendent and his staff.

I reported in 1925 that the following eleven methods of treatment had been tried :—(1) Alipoid T.B.E. (prescribed by Prof. Dreyer) ; (2) Dr. Paget's insufflator, by means of which dried tuberculin is drawn into the nostrils ; (3) Pneumosan ; (4) Endocrine substances ; (5) "Yadil" ; (6) Mr. Stevens' Drug (Umckaloabo) ; (7) The "Newell" preparation ; (8) Prof. Gabrilovitch's "La Phagolysine" ; (9) Sodium Morrhuate ; (10) Colloidogenine ; (11) Angiolymphe. In nine of them (1 to 9) the trials were completed, and the results in no instance justified the benefits claimed. The trial of the tenth and the eleventh were not completed until the end of 1927, and additional reports on the use of these preparations are now given :—

- (10) Colloidogenine—a glycerated extract of pig spleen, given hypodermically, or in a syrup form by the mouth. Preparation advocated by a French doctor. Tried on eight County patients without, however, confirming the claims made as to its benefit in the treatment of tuberculosis. The tests were very severe, as all the cases were advanced ones. Dr. A. D. Brunwin, who carried out the experiment, now reports that he was unable to detect any benefit, although one patient, whose sputum has remained positive, thought it did him good.
- (11) Angiolymphe—advocated by Dr. P. Rous, of Paris, and other foreign tuberculosis specialists. The treatment consists of the injection of angiolymphe, which is a vegetable preparation obtained from various Irideae and contains as its active principle glucosides of these plants. Dr. Pask, at the High Carley Sanatorium reported that three cases who were not responding to sanatorium treatment had a series of seventeen injections, but in no case was there any improvement as a result of the treatment, and the downhill progress was not in any way checked.

The following additional methods of treatment have been tried since the last report :—

- (12) Ostelin—claimed to be a preparation of the active medicinal portion of cod liver oil, separated from the fatty constituents of the oil, and presenting the Vitamin D, the factor which gives to cod liver oil its therapeutic value, in very high concentration. An idea of the concentration of Ostelin can be gained from the fact that 400 gallons of cod liver oil are needed to produce one pint of Ostelin.

Dr. Pask tried four children at Oubas House Sanatorium for a period of five weeks. The cases were children who were not responding so well to sanatorium treatment as the average. The particular properties of the Ostelin tablet composition are : Ostelin minims 4 ; Calc. Glycerphosp. grs. 2 ; One tablet given three times a day for five weeks.



The following is a brief record of the results obtained :—

TABLE 9.

Patient	Gain in weight in five weeks preceding Ostelin treatment.	Weight during five weeks Ostelin treatment given.	Weight during five weeks following Ostelin treatment.	Remarks.
A.	2½ lbs.	Gained ½ lb.	Gained 1 lb.	Temperature, pulse rate and general condition unchanged.
B.	2 lbs.	Gained 3 lbs.	Lost 1 lb.	General condition unchanged
C.	2 lbs.	Stationary.	Gained 1 lb.	do.
D.	1 lb.	Gained 2 lbs.	Gained 1 lb.	do.

Dr. Pask came to the conclusion that the progress of the cases was not influenced to any appreciable extent by the use of Ostelin.

(13) Nascent Iodine. Dr. Pask gave a trial to nascent iodine treatment, adopting the following technique :—

At 8 a.m. gave patient a draught of five ounces of water containing Pot. Iodide, grs. 30 ; at 12 noon, 2 and 4 p.m. gave one ounce of chlorine water in half a pint of lemonade. After 10 days increased the dose of chlorine water to 1½ ounces.

This treatment was tried on seven cases, four of which were very advanced and running high temperatures. On the whole it did not appear to have any very definite effect on the progress of the disease. In three cases it appeared definitely to relieve the symptoms and increase the patients' sense of well-being. Dr. Pask will consider continuing the treatment if any other suitable cases are willing to have it.

(14) Casco—a secret remedy which is very popular with the tuberculous public. Dr. Brunwin used it on two cases without any good result. One patient is still taking it privately and steadily getting worse. This remedy appears to be used surreptitiously by many patients in institutions.

(15) Friedmann's Vaccine.—An old preparation and consists of living tubercle bacilli prepared from turtles, and has been "pushed" again recently by a German firm. One or two doses are supposed to effect a cure, but of four cases treated by Dr. Brunwin, who undertook the trial, only one showed any improvement, and then only slight, and the sputum remained positive.

There is nothing further to report in regard to Mr. Spahlinger's method of treatment, as no supply of the particular vaccines and sera has yet become available for purposes of trial.

Although no specific remedy for tuberculosis has yet been found, the fact must not be overlooked that by the ordinary methods of treatment up to the end of 1927 there have been, in this County, 3,682 patients (1,806 pulmonary and 1,876 non-pulmonary) diagnosed and notified as suffering from tuberculosis written off the register of tuberculous cases as "cured."

(N.B.—As suggested by the Ministry of Health, a pulmonary case is considered cured if without symptoms for five years, and a non-pulmonary case if without symptoms for three years.)

## VII.—THE NOTIFICATION OF TUBERCULOSIS CASES.

It is the statutory duty of every medical practitioner to notify within 48 hours to the local medical officer of health any case of tuberculosis occurring in his practice, and the medical officer of health is charged with the duty of keeping a register of such cases reported in his sanitary district.

According to the returns made by the local medical officers of health to the County Council for the last quarter of 1927, there was a total of 13,081 tuberculous persons on the registers of the 120 sanitary authorities in the County. This figure includes, however, all the notified cases in asylums, union infirmaries and other public institutions, and cases which are not suitable for treatment under the County scheme. The local registers are not all yet entirely correct, but one by one they are being compared with the County records of cases and, where necessary, corrections made to bring them up to date. This scrutiny of registers has involved much additional work at the central office and at the dispensaries, particularly in dealing with cases notified ten to fifteen years ago.

### NON-NOTIFICATION.

I have continued to direct special attention to the notification of cases of tuberculosis, and have engaged in correspondence with medical practitioners, medical officers of health, and medical superintendents over many individual cases.

In the Administrative County, the decline in the extent of non-notification of pulmonary cases is shown in the following statement :—

TABLE 10.

	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
Number of deaths from pulmonary tuberculosis recorded ... ..	1652	1339	1323	1301	1362	1250	1215	1205	1158	1105
Proportion of deaths from pulmonary tuberculosis not notified under Regulations during life ...	18%	16%	13%	10%	8%	7%	5·2%	5·5%	5·0%	4·8%



The striking and progressive improvement which has been secured in the notification of cases of pulmonary tuberculosis before death would not have been practicable without the cordial co-operation of the local medical officers of health and, of course, the general practitioners who make the notifications.

There is no doubt that in this Administrative County a much smaller proportion of cases of tuberculosis escapes notification than is frequently the experience in other parts of the country. Thus, we have fewer unknown cases or unknown sources of infection remaining outside the measures for the control of tuberculosis, and, in my opinion, this better notification is helping materially to reduce the number of new cases occurring.

For non-pulmonary tuberculosis, the proportion of non-notified fatal cases to total deaths from this form of the disease was in 1927 14·1 per cent. which is much below the average (22·1 per cent.) of the years 1918 to 1926.

#### REASONS FOR NON-NOTIFICATION.

Since 1920 special investigations have been made into every individual death recorded from tuberculosis which had not been previously notified as a case under the Regulations, and the results of the investigations in 1927—which confirmed the findings of previous years—showed that 30 per cent. of the deaths at private addresses related mainly to fulminating cases of pulmonary tuberculosis in adults and acute cases of meningitis in children, with no doctor in attendance at all, or only for a matter of a few days prior to death. Complicated cases presenting difficulty in diagnosis accounted for 25 per cent. In 26 per cent. notification was not made owing to a misunderstanding of the Tuberculosis Regulations or to the belief that the case had already been notified by another practitioner. The instances in which there appeared to be no reasonable excuse for non-notification represented 10 per cent.

The efficiency of notification varies directly with the efficiency of the county council or county borough scheme dealing with tuberculosis. If there is no really comprehensive scheme, if there are poor and newly qualified, part-time, and badly paid tuberculosis officers, if there are insufficient means for expert diagnosis, and too few beds for treatment, then a high proportion of non-notified fatal cases will be the rule and not the exception.

#### TOTAL "KNOWN SOURCES OF INFECTION."

One effect of the better notification of cases by practitioners has been to throw up the number of new cases in recent years and to make the figures disadvantageously comparable with the earlier years when a larger number of cases escaped notification.

It is, however, possible to obtain a truer record of the number of cases of pulmonary tuberculosis occurring year by year by adding together (a) the notifications and (b) the deaths which occurred without notification being made during life ; this total gives clearly the number of known sources of infection as the following table shows :—

TABLE 11.

YEAR	Pulmonary Tuberculosis.		
	Cases Notified (during life)	Cases reported at time of death only.	Total known sources of infection.
1918 ... ..	2,534	303	2,837
1919 ... ..	2,105	221	2,326
1920 ... ..	2,084	177	2,261
1921 ... ..	2,044	135	2,179
1922 ... ..	1,863	105	1,968
1923 ... ..	1,937	85	2,022
1924 ... ..	1,972	64	2,036
1925 ... ..	1,846	67	1,913
1926 ... ..	1,828	58	1,886
1927 ... ..	1,794	54	1,848

The decline in the number of “known sources of infection” of pulmonary tuberculosis is therefore considerably greater than the fall in the notified cases if taken alone.



## VIII.—APPLICATIONS FOR TREATMENT.

Table 12 below shows the number of “ new ” persons (2,369) who applied for treatment under the County scheme during the year 1927 :—

TABLE 12.

	Number of Applications received during 1927.	Number Received Treatment.			
		Pulmonary Cases.	Pulmonary and Non-Pulmonary.	Non-Pulmonary Cases.	Diagnosis not Confirmed (non-tuberculous).
Men ... ..	892	715	28	144	5
Women ... ..	807	557	24	217	9
Boys ... ..	360	73	15	267	5
Girls ... ..	310	82	7	218	3
<b>TOTAL</b> ...	<b>2369</b>	<b>1427</b>	<b>74</b>	<b>846</b>	<b>22</b>

N.B.—In this table a person who received treatment within the period appears once only, even though he has received treatment in more than one form.

Applications received in previous years were :—Average for 1914–17, 1,790 ; 1918–21, 2,294 ; 1922–25, 2,183 ; and 1926, 2,278.

During 1927, there were 2,839 cases notified under the Public Health (Tuberculosis) Regulations as suffering from tuberculosis (all forms) ; whereas the number of persons who applied for treatment to the County Council was 2,369, equal to 83 per cent. of the notifications. In the previous year the percentage was 81, and in 1925 73. Thus, an increasing proportion of the notified cases apply to the County Council for treatment.

With regard to the balance (namely 17 per cent.) of the notifications where the patients did not apply to the County Council for treatment, the principal reasons for this were : patients suffering from tuberculous meningitis or other fatal forms of the disease ; patients removed out of County area ; cases in which the diagnosis was not confirmed and no treatment required ; and patients who, for some reason or other, did not wish to avail themselves of the benefits under the County scheme.

## CLASSIFICATION OF NEW PATIENTS.

*(a) Pulmonary Tuberculosis.*

During 1927, applications for treatment were received from 1,501 new patients, and these were reported by the tuberculosis officers to be in the undermentioned stages of the disease on the first examination :—

T.B. Minus (Sputum negative or absent) ...	...	713, or 47·5 per cent.		
T.B. Plus 1 (Early cases, sputum positive) ...	...	90, or 6·0	,,	,,
T.B. Plus 2 (Intermediate cases, sputum positive) ...	...	466, or 31·0	,,	,,
T.B. Plus 3 (Advanced cases, sputum positive) ...	...	232, or 15·4	,,	,,
		<hr/>		
		1,501	100·0	,,
		<hr/>		

It is only too well known that, throughout the country generally, tuberculosis officers do not get their new cases early enough. Many patients through ignorance, many on account of economic reasons, neglect to consult a doctor when in the early stage, and so lessen their chance of recovery. In the Administrative County we have for several years made special investigations into the reasons underlying such disastrous delay on the part of patients. These investigations have been continued in 1927, yielding the following conclusions, which correspond very closely with the conclusions published in previous reports :—

1.—Altogether 72 per cent. of the advanced cases either had no doctor or had only been attending their doctor for less than two months when first examined by the tuberculosis officer or notified.

2.—After making allowance for a percentage of fulminating cases (“galloping consumption”), a large proportion—nearly three-fourths—of patients had felt ill for one or more months before consulting a doctor.

3.—The reason for late notification and patients delaying their application until in an advanced stage of the disease is chiefly the disinclination or unwillingness of the patients to report themselves to their doctor when feeling ill. This is due mainly to the insidious onset of the disease, the discomfort being only slight at first.

4.—There does not appear to be evidence in any large number of cases of unreasonable delay on the part of family doctors referring cases to the tuberculosis officer.

5.—The initiative to seek treatment when ill rests with the patient himself, and the only feasible remedy lies in the education



of the public as to symptoms and common dangers of tuberculosis and the need for securing prompt treatment. This cannot be too strongly or too often emphasised.

With regard to the last conclusion 5, there are many difficulties in the way of reaching the people who most require such education. On the tuberculosis officer rests chiefly the duty of stimulating public interest, but an increasing number of sanitary authorities and voluntary care committees are assisting in propaganda work. More satisfactory results will, I think, accrue now that there is indication that steps are being taken to teach hygiene to the older children at school following on the issue in January 1928, by the Board of Education of a "Handbook of suggestions on Health Education for the consideration of teachers and others concerned in the work of public elementary schools."

The tuberculosis medical staff have to depend very largely on the general practitioners throughout the County for bringing forward tuberculous patients, and it is satisfactory to note that as reported on page 16, 83 per cent. of new cases are sent *before notification* to the tuberculosis officers for an opinion as to diagnosis. Too much importance is still laid by some doctors on sputum examinations alone, and often too long a time is allowed to elapse in order that the sputum may be tested; or steps are not taken to report the case until it is returned as "positive."

(b) *Non-Pulmonary Tuberculosis.*

There were 846 new cases diagnosed by the tuberculosis officers as suffering from non-pulmonary tuberculosis in the following forms :—

Bones and joints	...	...	...	218	} 846
Abdomen	...	...	...	133	
Other organs	...	...	...	29	
Peripheral glands	...	...	...	404	
Skin	...	...	...	62	

In 1926 the number of applications from non-pulmonary cases was 779. The increase in 1927 of 67 can be mainly accounted for by the establishment of light centres at County tuberculosis dispensaries for the treatment of suitable non-pulmonary cases which has influenced general practitioners to send more cases.

## IX.—SUMMARY OF WORK DONE THROUGH THE DISPENSARY ORGANISATION IN 1927.

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It will be observed from the table on page 58 that 5,443 new persons (including contacts) were examined at their homes or at the dispensaries by the tuberculosis officers for purposes of diagnosis. Visits by the tuberculosis officers to the homes of tuberculous persons numbered 6,002, and attendances of patients at the dispensaries numbered 38,222 (which figure includes 14,322 attendances for artificial light treatment).

Attention has again been paid to reviewing the cases on the register, and during the year the following were written off and will not again be visited or examined :—pulmonary cases found to be cured (*i.e.*, disease quiescent for two years and then arrested for three or more years and no symptoms of disease present), 444 ; non-pulmonary cases found to be cured (*i.e.*, disease arrested for three or more years and no symptoms of disease present), 531 ; cases notified in error by practitioners and notifications cancelled, 153 ; cases (not notified) found to be non-tuberculous, 14.

Table A, here inserted, shows the dispensary areas with the population, present staff, the addresses of the 24 dispensaries at present in use, and the days and times on which they are open.

### EVENING SESSIONS AT DISPENSARIES.

As in previous years, the evening sessions have been regularly held at most of the dispensaries for the convenience of patients who are at work during the day.

### TUBERCULOSIS OFFICERS' VISITS TO SANATORIA AND HOSPITALS.

Periodical visits (mostly monthly) have continued to be paid by one or other of the consultant tuberculosis officers to the majority of the pulmonary hospitals, non-County sanatoria, and special hospitals treating County patients. These visits are of mutual help, inasmuch as they keep in touch the medical superintendent and the tuberculosis officer, who are able to confer on the patients' future treatment, the home circumstances, the provisions of the County scheme, and so on.

### STATISTICS REQUIRED BY MINISTRY OF HEALTH.

By Memorandum 37/T, issued in September, 1925, the Ministry require certain information concerning the work done at tuberculosis dispensaries. These statistics, in the compulsory Table I. of the Memorandum, are given in Appendix III. of this report.



TABLE A.

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LIST OF DISPENSARIES AND THE TUBERCULOSIS  
OFFICERS FOR THE DISPENSARY AREAS.

LANCASHIRE COUNTY COUNCIL.

Table A.—List of Tuberculosis Dispensaries in use in October, 1928, and the Tuberculosis Officers for the Dispensary Areas.

SANITARY DISTRICTS.			Estimated Civilian Population 31/12/27.	MEDICAL STAFF October, 1928.	NURSING STAFF.	DISPENSARIES (Chief and Branch).	Days and Hours of DISPENSARY SESSIONS (Distinct from Home Visiting, attending Sanatoria, Hospitals and Care Committees, etc.).
Adlington Blackrod Carnforth Chorley (B.) Chorley (R.) Croston Fulwood Garstang (R.), Part of, consisting of parishes of— Barnacre-with-Bonds Bilsborrow Bleasdale Cabus	Garstang (R.) <i>continued</i> Catterall Cloughton Cleveley Forton Garstang Holleth Kirkland Myerscough Nateby Nether Wyresdale Winnarleigh	Heysham Horwich Lancaster (B.) Lancaster (R.) Leyland Longridge Lunesdale (R.) Lytham St. Annes (B.) Morecambe (B.) Preston (R.) Walton-le-Dale Withnell	255,076	Dr. A. D. Brunwin, Tuberculosis Dispensary, 8 Middle Street, Lancaster. Assistant Tuberculosis Officer— Dr. G. H. Leigh.	Nurse L. Walker  Nurse F. D. Abbott Nurse G. M. Hunter  Nurse J. Skelecher	LANCASTER (Chief), 8 Middle Street (Tel. No. 568). (X-ray Apparatus and Artificial Light Installation).  CHORLEY (Branch), 59 Gillibrand St. (Tel. No. 263). (Artificial Light Installation).  PRESTON (Branch), 22 Bolton Street (Tel. No. 1111). (Artificial Light Installation).	Monday, 11 a.m. 1st Monday evening of month by appointment.  Monday by appointment. Thursday, 11 a.m. 2nd Tuesday evening of month by appointment. Wednesday, 11 a.m. Monday evening before 2nd Tuesday of month by appointment.
FURNESS SUB-AREA— Dalton-in-Furness Grange-over-Sands	Ulverston	Ulverston (R.)	39,328	Dr. E. H. A. Pask, High Carley Sanatorium, near Ulverston (Tel. No. 110 Ulverston).	Nurse E. A. Duston	ULVERSTON (Branch), Virginia House (Tel. No. 145). (Artificial Light Installation). (X-ray Apparatus at High Carley Sanatorium).	Tuesday, 10 a.m. Thursday, 10 a.m.
FYLDE SUB-AREA— Fleetwood Fylde (R.) Garstang (R.), Part of, consisting of parishes of— Great Eccleston Hambleton	Inskip-with-Sowerby Out Rawcliffe Filling Stalmine-with-Stainall Upper Rawcliffe	Kirkham Poulton-le-Fylde Presall Thornton Cleveleys	60,285	Dr. G. Leggat, Elswick Sanatorium, near Kirkham (Tel. No. 22 Great Eccleston).	Nurse A. Tweedy	FLEETWOOD (Branch), 23 Poulton Rd. (Tel. No. 282). (Artificial Light Installation). (X-ray Apparatus at Elswick Sanatorium).	Tuesday, 10 a.m.
Accrington (B.) Bacup (B.) Barrowford Blackburn (R.) Brierfield Burnley (R.) Church	Clayton-le-Moors Clitheroe (B.) Clitheroe (R.) Colne (B.) Darwen (B.) Great Harwood Haslingden (B.)	Nelson (B.) Oswaldtwistle Padiham Rawtenstall (B.) Rishton Trawden Turton	355,674	Dr. B. MacPhee, Tuberculosis Dispensary, 39 Avenue Parade, Accrington. Assistant Tuberculosis Officers— Dr. S. C. Adam Dr. F. C. S. Bradbury	Nurse L. F. Norwood Nurse E. Watterson  Nurse M. Duggan  Nurse A. Munro Nurse H. M. Alcock  Nurse R. Lambert	ACCINGTON (Chief), 39 Avenue Parade (Tel. No. 2443).  DARWEN (Branch), 20 Railway Road (Tel. No. 408). (X-ray Apparatus).  NELSON (Branch), 64 Carr Road (Tel. No. 507).  STACKTEADS (Branch), Knott Hill House (Tel. No. 201 Bacup). (Artificial Light Installation).	Tuesday, 2 p.m. Wednesday, 2 p.m. 2nd Tuesday of month, 6 p.m. Friday, 10 a.m.  Tuesday, 2 p.m. Friday by appointment.  Monday, 2 p.m. 1st Monday of month, 6 p.m.
Ashton-under-Lyne (B.) Audenshaw Bury (R.) Chadderton Crompton Denton Droylsden Failsworth	Heywood (B.) Lees Limehurst (R.) Littleborough Middleton (B.) Milnrow Mossley (B.) Norden	Prestwich Radcliffe Ramsbottom Royton Tottington Wardle Whitefield Whitworth	368,383	Dr. J. L. Stewart, Tuberculosis Dispensary, Boston House, Warrington Street, Ashton-under-Lyne. Assistant Tuberculosis Officers— Dr. G. Fletcher Dr. C. Berry	Nurse H. Dewsnap Nurse M. Sherwen Nurse C. Guilfooy Nurse M. A. Potter  Nurse C. Guilfooy  Nurse I. F. MacDonald Nurse M. A. Potter  Nurse A. Flynn Nurse H. Dewsnap Nurse M. Sherwen  Nurse A. Flynn	ASHTON-UNDER-LYNE (Chief), Boston House, Warrington Street (Tel. No. 775). (X-ray Apparatus and Artificial Light Installation).  MIDDLETON (Branch), 71 Manchester Old Road.  MOSSLEY (Branch), Park Lodge.  OLDHAM (Branch), 25 Barker Street (Tel. No. 1671).  RADCLIFFE (Branch) 41 Darbyshire St. (Tel. No. 323). (Artificial Light Installation).  ROCHDALE (Branch), 168 Drake Street (Tel. No. 392).	Monday, 10-30 a.m. for X-ray examinations. Tuesday, 3 p.m. Friday, 10 a.m. 1st Tuesday of month, 6-30 p.m. Friday, 3 p.m. 2nd Friday of month, 6-30 p.m.  Tuesday, 11 a.m.  Monday, 3 p.m. 2nd Monday of month, 6-30 p.m. Wednesday, 10 a.m. Wednesday, 2-30 p.m. 3rd Wed. of month, 6-30 p.m.  Thursday, 10 a.m. 2nd Thursday of month, 7 p.m.
Atherton Barton-upon-Irwell (R.) Eccles (B.) Farnworth Irlam Kearsley	Leigh (B.) Leigh (R.) Little Hulton Little Lever Stretford	Swinton and Pendlebury Tyldesley-with-Shakerley Urmston Westhoughton Worsley	342,606	Dr. G. Jessel, Tuberculosis Dispensary, 13, Church Street, Leigh. Assistant Tuberculosis Officers— Dr. A. B. Jamieson Dr. J. Cathcart	Nurse A. Worsley Nurse M. W. Stringman  Nurse M. B. Jones Nurse H. M. Shakespeare  Nurse F. G. Smith  Nurse A. Dickinson  Nurse D. Grime	LEIGH (Chief), 13 Church Street (Tel. No. 258).  ECCLES (Branch), 28 and 30 Gilda Brook Road (Tel. No. 533). (X-ray Apparatus and Artificial Light Installation).  FARNWORTH (Branch), 19-23 Darley Street (Tel. No. 63).  PENDLEBURY (Branch), 121 Station Road (Tel. No. 295 Eccles).  STRETTFORD (Branch), 14 Derbyshire Lane (Tel. No. 110 Trafford Park).	Wednesday, 9-30 a.m. Friday, 9-30 a.m. 2nd Thurs. of month, 6-30 p.m. Monday, 2 p.m. for X-ray examinations. Tuesday, 2 p.m. Friday, 9-30 a.m. 1st Wed. of month, 6-30 p.m. Tuesday, 9-30 a.m. Friday, 2 p.m. 3rd Thurs. of month, 6-30 p.m. Monday, 2 p.m. Wednesday, 9-30 a.m. Last Thurs. of month, 6-30 p.m. Tuesday, 9-30 a.m. Thursday, 9-30 a.m. Last Monday of month, 6-30 p.m.
Abram Ashton-in-Makerfield Aspull Billinge and Winstanley Formby Golborne Great Crosby Haydock Hindley Huyton-with-Roby	Ince-in-Makerfield Lathom and Burscough Litherland Little Crosby Newton-in-Makerfield Ormskirk Orrell Prescot Rainford Sefton (R.)	Skelmersdale Standish-with-Langtree Upholland Warrington (R.) Waterloo-with-Seaforth West Lancashire (R.) Wiston (R.) Widnes (B.) Wigan (R.)	378,948	Dr. C. W. Laird, Tuberculosis Dispensary, 7 Claremont Road, Seaforth. Assistant Tuberculosis Officers— Dr. C. H. Lilley Dr. G. B. Charnock	Nurse A. Duncan Nurse I. Laing  Nurse E. Walsh Nurse L. Farquhar  Nurse M. J. Wilson  Nurse E. Walters Nurse F. Milnes	SEAFORTH (Chief), 7 Claremont Road (Tel. No. 688 Waterloo). (X-ray Apparatus).  ST. HELENS (Branch), 90 Hardshaw Street (Tel. No. 916). (Artificial Light Installation).  WIDNES (Branch), Brendan House, Widnes Road (Tel. No. 156).  WIGAN (Branch), 14 Rodney Street (Tel. No. 549).	Monday, 3 to 4-30 p.m. Thursday, 10-30 a.m. for X-ray examinations. Friday, 10 to 11-30 a.m. 3rd Thursday of month, 6 p.m. Tuesday, 3 to 4-30 p.m. Last Tues. of month, 6 to 7 p.m.  Monday, 10 to 11-30 a.m. Friday, 2-30 to 4-30 p.m. 1st Wed. of month, 6 to 7 p.m. Monday, 9-30 a.m. Thursday, 9-30 a.m. 4th Thurs. of month, 6-30 p.m.
			1,800,300				



## TOTAL NUMBER OF CASES UNDER SUPERVISION.

Table 13 shows the total number of persons who were suffering or suspected to be suffering from tuberculosis, and who were under the supervision of the dispensary staff at the end of 1927. As a matter of interest, the number of cases per 1,000 of the population has also been calculated for each area :—

TABLE 13.—*Tuberculous Cases on Dispensary Registers on 31st December, 1927 (including 819 patients in Sanatoria and Hospitals).*

Dispensary Area.	Estimated Population, 31-12-27.	Number of Cases under Supervision on 31-12-27.										No. of Cases of Tuberculosis under supervision per 1,000 of Population.	No. of Doubtful Cases on 31-12-27.
		Pulmonary Tuberculosis.				Non-Pulmonary Tuberculosis.				Total No. of Cases.			
		15 years and over.		Under 15 years of age.		15 years and over.		Under 15 years of age.					
		M.	F.	M.	F.	M.	F.	M.	F.				
No. 1 ...	255,076	286	208	61	43	122	132	134	123	1109	4.34	3	
No. 2 ...	355,674	328	258	9	8	142	152	78	60	1035	2.90	14	
No. 3 ...	368,383	526	444	36	41	207	266	147	114	1781	4.83	1	
No. 4 ...	342,606	531	395	25	33	176	246	150	143	1699	4.95	7	
No. 5 ...	378,948	577	422	90	95	170	202	230	194	1980	5.22	36	
Furness ...	39,328	116	109	32	39	16	31	20	11	374	9.50	—	
Fylde ...	60,285	92	88	14	12	38	39	49	35	367	6.08	2	
TOTAL ...	1,800,300	2456	1924	267	271	871	1068	808	680	8345	4.63	63	
		4380		538		1939		1488					
		4918				3427							

## TUBERCULOUS EX-SERVICEMEN.

Of the 8,408 patients under supervision of the dispensary staff at the end of 1927, 432 were discharged sailors, soldiers or airmen whose disease was held by the Ministry of Pensions to be attributable to or aggravated by service in the Great War and a pension granted for the disability. The number of these tuberculous pensioners is declining, falling from 1,017 at the end of 1922 to the figure of 432 mentioned above.

# SUMMARY OF DISPENSARY WORK DONE BY TUBERCULOSIS OFFICERS IN 1927, SHOWING COMPARISON WITH 1926.

VISITS BY TUBERCULOSIS OFFICERS TO PATIENTS' HOMES—	1926	1927
(a) Number of new persons (including new contacts) examined for diagnosis or expert opinion ... ..	1,594	1,387
(b) Number of re-examinations of "old" cases and "old" contacts—		
1. Respecting continued general supervision or dispensary treatment ... ..	4,151	3,907
2. Contacts respecting diagnosis ... ..	32	50
3. Other cases respecting diagnosis ... ..	162	161
4. For special forms of treatment or examinations resulting therefrom—		
Aspirations... ..	29	25
Adjustment of splints and surgical appliances ...	343	412
Lupus ... ..	33	56
Pneumothorax (Induction and refills) ... ..	8	4
Tuberculin ... ..	25	0
Other forms ... ..	22	0
	<u>6,399</u>	<u>6,002</u>

## DISPENSARY ATTENDANCES BY PATIENTS—

(a) Number of new persons (including new contacts) examined for diagnosis or expert opinion ... ..	4,053	4,056
(b) Number of re-examinations of "old" cases and "old" contacts—		
1. Respecting continued general supervision or dispensary treatment ... ..	16,015	15,951
2. Contacts respecting diagnosis ... ..	309	306
3. Other cases respecting diagnosis ... ..	1,972	2,189
4. For special forms of treatment or examinations resulting therefrom—		
Artificial light (Lancaster, Chorley, Preston, Ashton-under-Lyne and Eccles Dispensaries) ... ..	11,892	14,322
Aspirations ... ..	183	122
Adjustment of splints and surgical appliances ...	828	812
Lupus ... ..	208	340
Pneumothorax (Induction and refills) ... ..	24	49
Tuberculin ... ..	25	15
Other forms ... ..	22	60
	<u>35,531</u>	<u>38,222</u>

## X-RAY EXAMINATIONS MADE AT COUNTY DISPENSARIES AND INSTITUTIONS—

(a) Dispensary patients ... ..	4,440	5,239
(b) Institutional patients... ..	351	617
	<u>4,791</u>	<u>5,856</u>

EXAMINATIONS OF SPUTUM AT COUNTY DISPENSARIES ... ..	5,490	5,432
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## NUMBER OF RECOMMENDATIONS BY TUBERCULOSIS OFFICERS—

1. Sanatorium or hospital treatment ... ..	2,071	2,105
2. Dispensary treatment or general supervision ... ..	15,135	12,632
3. Provision of special nourishment ... ..	1,676	1,545
4. Provision of surgical appliances ... ..	137	127
5. Loan of shelters ... ..	24	19
6. Diagnosis not confirmed—		
(a) Notified cases ... ..	191	153
(b) Non-notified cases ... ..	49	14
7. Cases written off the Register as refusing treatment ...	32	44
8. Pulmonary cases written off the Register as cured ...	562	444
9. Non-pulmonary cases written off the Register as cured ...	483	531



CARE COMMITTEE MEETINGS ATTENDED BY—	1926	1927
(a) Tuberculosis officers ... ..	95	87
(b) Tuberculosis health visitors ... ..	131	135
LECTURES AND ADDRESSES GIVEN ON TUBERCULOSIS ... ..	19	21
VISITS BY TUBERCULOSIS OFFICERS TO SANATORIA, PULMONARY AND SPECIAL HOSPITALS AND POOR LAW INFIRMARIES ...	246	233
SPECIAL VISITS BY TUBERCULOSIS OFFICERS ( <i>i.e.</i> , interviews with medical officers of health, general hospital officials, &c.) ...	90	82
VISITS BY DISPENSARY NURSES TO PATIENTS' HOMES—		
Routine visits ... ..	45,622	42,463
Actual nursing ... ..	1,014	932
Application of surgical dressings... ..	1,573	1,010
Adjustment of splints and surgical appliances ... ..	2,123	2,103
	<u>50,332</u>	<u>46,508</u>
PATIENTS' DISPENSARY ATTENDANCES FOR ATTENTION BY NURSES—		
Application of surgical dressings ... ..	2,040	1,907
Adjustment of splints and surgical appliances ... ..	184	100
	<u>2,224</u>	<u>2,007</u>

### HOUSING.

The following table shows the housing conditions of all patients who have applied to the County Council for treatment and who were under treatment or supervision at the end of 1927. Whilst every effort is made to secure that infectious cases occupy a separate room, or at least a separate bed, no useful purpose is served by making the same insistence in regard to patients with the disease quiescent or arrested. The non-pulmonary cases are given separately, and only a very small number indeed may be considered infectious.

TABLE 14.—*Housing Statistics of 8,295 County Patients.*

		Patients Occupying Separate Bedroom.	Patients Occupying Separate Bed, but not Separate Bedroom.	Not Separate Bed.
Total number of Pulmonary cases considered infectious or contagious.	Under 15 years	6	7	5*
	15 and over ...	1,211	463	144*
Total number of Pulmonary cases not considered infectious or contagious.	Under 15 years	91	207	221
	15 and over ...	942	558	1,044
Total number of Non-Pulmonary cases.	Under 15 years	164	607	701
	15 and over ...	497	436	991
TOTAL ...	Under 15 years	261	821	927
	15 and over ...	2,650	1,457	2,179

\* Of the 149 infective patients without a separate bed, 46 were isolated in sanatoria or pulmonary hospitals at the end of 1927.

Of the infective pulmonary cases at home, 5·7 per cent. had not a separate bed or room.

## EXAMINATION OF HOUSE CONTACTS.

By the systematic examination of house contacts, particularly among those of patients with positive sputum, many early or unsuspected cases of tuberculosis are detected. Owing to indifference or unwillingness, considerable difficulty (which, however, is gradually being overcome) is experienced in persuading contacts to come to the dispensary for examination, or even to submit themselves for examination at all, and it, therefore, follows that the tuberculosis officer has to see a large proportion of them at their homes.

TABLE 15.—*Contacts\* examined during 1927.*

	Diagnosed as Tuberculous.		Doubtful. †	Non-Tuberculous.	Total.
	Pulmonary.	Non-pulmonary.			
Examined at Home ...	12	1	7	93	113
Examined at Dispensary	54	35	45	651	785
Total ... ..	66	36	52	744	898
	102				

\* In accordance with the direction of the Ministry of Health in Memorandum 121/T, cases are entered as contacts only if the cause of their being examined is the fact that they have recently been, or still are, living in contact with some dispensary patient or other notified case; many persons suffering, or suspected to be suffering, from tuberculosis who attend at the dispensary of their own accord, or who are referred by a private medical practitioner, may give a history of previous contact with a known case of tuberculosis, but this does not render them "contacts."

† In the 52 doubtful cases the diagnosis of tuberculosis had not been made within one month of the first examination, and they are so classified as doubtful in accordance with the Ministry of Health's Memorandum 37/T.

Out of the 898 new contacts examined during the year, 102 were ultimately diagnosed as definite cases of tuberculosis—pulmonary 66 and non-pulmonary 36. These cases are equal to 113·5 per 1,000 of contacts examined, as against the proportion of 4·63 tuberculous persons per 1,000 of the population known to the dispensary staff in the County. Thus, the examination of contacts revealed many more tuberculous cases proportionately than would be found in the ordinary population.

It may be stated that of the 66 pulmonary cases, 20 per cent. were found with a positive sputum.



## PROVISION OF BEDSTEADS, MATTRESSES, AND NURSING REQUISITES.

In each County dispensary area a small stock of bedsteads, mattresses (but not bedding), and nursing requisites belonging to the County Council is available for loan to necessitous patients undergoing home treatment.

The table following shows the number of these articles owned by the County Council, and also the number of patients who have been granted the use of the articles :—

TABLE 16.

Articles.	Quantity owned by County Council, 31/12/27.	Number of patients to whom articles have been loaned during 1927.	Articles in possession of patients on 31/12/27.
Bedsteads ... ..	194	41	153
Mattresses ... ..	198	55	156
Mattress Covers ... ..	150	39	108
Air Beds ... ..	3	17	3
Air Cushions ... ..	135	178	110
Air Pillows ... ..	21	—	—
Bath Chairs... ..	5	4	5
Bed Cradles ... ..	6	2	1
Bed Pans ... ..	110	83	60
Bed Rests ... ..	59	60	32
Bed Slippers ... ..	72	22	15
Extension Apparatus ... ..	12	1	2
Fracture Boards ... ..	2	—	—
Ground Sheets ... ..	50	5	22
Hot Water Bottles, Rubber ... ..	6	2	3
Ice Bags ... ..	2	—	—
Rest Chairs ... ..	4	2	2
Rubber Sheeting ... ..	19 yds.	—	1½ yds.
Rubber Sheets ... ..	13	5	3
Spinal Boxes ... ..	22	12	7
Spinal Carriages ... ..	17	9	5
Splints ... ..	16	1	1
Urinals... ..	109	66	59
Water Beds... ..	15	3	3

The bedsteads, mattresses, &c., are held at the disposal of the consultant tuberculosis officers, and proper receipts are obtained from patients for articles loaned to them.

The action of the County Council in sanctioning the purchase of these articles has proved of valuable assistance in securing the better accommodation at home of persons with pulmonary tuberculosis considered to be infectious or contagious, especially in view of the present-day overcrowding which is general throughout the country, due to the house shortage.

### ARTIFICIAL LIGHT TREATMENT.

A report on the work done at the artificial light centres established at the Lancaster, Chorley and Ashton-under-Lyne dispensaries is given in chapter IV.

### X-RAY WORK.

X-ray installations for use by the tuberculosis officers for the examination of patients in order to assist in the diagnosis of doubtful and difficult cases of tuberculosis—both pulmonary and non-pulmonary forms—have been provided as follow by the County Council in each dispensary area, except Area 2, where a special arrangement exists :—

Area 1.—Lancaster (Chief) Dispensary.

Area 2.—Darwen (Branch) Dispensary (by arrangement with local Radiological Society), and also at the Withnell Pulmonary Hospital for in-patients and occasional dispensary area cases. Plant installed at Withnell, August, 1927.

Area 3.—Ashton-under-Lyne (Chief) Dispensary (New apparatus being provided in July, 1928).

Area 4.—Eccles (Branch) Dispensary, and also at the Peel Hall Pulmonary Hospital for in-patients and occasional dispensary area patients. Plant installed at Peel Hall, August, 1928.

Area 5.—Seaforth (Chief) Dispensary and also at the Rufford Pulmonary Hospital for in-patients and occasional dispensary area cases. Plant installed at Rufford, May, 1926.

Furness.—High Carley Sanatorium, for the dispensary sub-area and sanatorium patients.

Fylde.—Elswick Sanatorium, for the dispensary sub-area and sanatorium patients.

With each plant there is a Potter-Bucky diaphragm to enable clearer skiagrams to be taken of deep-seated bones.

The policy of placing an apparatus in each dispensary area for use by the tuberculosis officer himself is, from experience, found to be the best method, because the tuberculosis officer, with his knowledge of the patient's history and clinical signs, is most fitted to make a correct interpretation of the skiagrams. Cases are from time to time discovered by the tuberculosis officers which, but for the help afforded by X-ray examinations, would have been sent to an institution for the treatment of non-pulmonary tuberculosis. A few of such cases are alone sufficient to pay for the original cost of an X-ray apparatus. The various installations are also of use in the control and continuation of artificial pneumothorax treatment commenced during a patient's stay at a sanatorium or hospital.



The following statement shows the X-ray work done during 1927, compared with previous years :—

TABLE 17.

	1921.	1922.	1923.	1924.	1925.	1926.	1927.
At County Dispensaries and and Institutions :							
(a) Dispensary patients ...	657	771	2159	4045	3899	4440	5239
(b) Institutional patients...	—	16	193	160	205	351	617
At Manchester ... ..	222	192	82	24	11	—	—
Total ... ..	879	979	2434	4229	4115	4791	5856

Chapter V. deals with tuberculosis and silicosis, and included are a number of X-ray photographs.

#### EXAMINATION OF SPUTUM.

As an aid to diagnosis, arrangements are in existence for the examination, free of cost, of specimens of sputum sent by medical attendants. At each chief dispensary a small laboratory is installed for this work ; whilst, in addition, an arrangement exists with the Director of the Public Health Laboratory, Manchester, for the examination of specimens.

The following statement shows the results of the examinations made in 1927, compared with the previous year :—

	At Dispensary Laboratories.		At Public Health Laboratory, Manchester.	
	1926.	1927.	1926.	1927.
Positive ( <i>i.e.</i> , tubercle bacilli present) ...	1,019	1,060	233	182
Negative ( <i>i.e.</i> , tubercle bacilli not found).	4,471	4,372	454	399
Total .. ..	5,490	5,432	687	581

#### PROVISION OF SPECIAL NOURISHMENT.

The provision of special nourishment is, in suitable cases, of great value to a patient in helping him to recover from the disease. A large proportion of cases have been allowed special nourishment pending removal to an institution, and these grants have undoubtedly enabled patients to commence their institutional treatment in a more favourable state than they would have been without it. The effect may, on the whole, be said to have shortened the period of institutional treatment for many patients.

During the year, 1,545 grants of special nourishment (subject to certain conditions, published in the 1924 report) for varying periods were made to 687 individual patients. The figures in 1926 were 1,676 grants to 793 patients.

### SPECIAL SURGICAL APPLIANCES.

During 1927 the following surgical appliances were supplied to patients, on the recommendation of the tuberculosis officers :—

Celluloid splint, 2 ; elbow splint, 2 ; foot splint, 5 ; hand splint, 1 ; hip splint, 6 ; knee splint, 8 ; leg splint, 4 ; 'Thomas' caliper splint, 9 ; wrist splint, 1 ; abduction frame, 3 ; Bradford frame, 1 ; double frame, 1 ; spinal frame, 4 ; abdominal support, 1 ; back support, 2 ; spinal support, 19 ; spinal jacket, 2 ; crutches, 18 pairs ; patten, 9 ; artificial limb, 6 ; leg stump, 1 ; celluloid collar, 1 ; Taylor's brace, 2 ; cuirass, 7 ; pylon, 1 ; surgical boot, 22.

### SLEEPING SHELTERS.

There were, at the end of the year, 45 shelters in use by patients at their homes. Six new shelters were purchased early in 1928. I have to thank medical officers of health and sanitary inspectors throughout the County for much valuable help in connection with the removal, disinfection, and re-erection of shelters used by County patients.

The loan of sleeping shelters is made to suitable cases on the recommendation of the tuberculosis officer, after careful consideration of the following points : (1) the condition of the patient and his ability to use the shelter properly ; (2) the position of the shelter ; (3) the home conditions of the patient ; and (4) the means of communication with the nearest inhabited building in case of a sudden relapse.

The number of persons in 1927 who were allowed the use of the shelters was 66.

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## X.—REPORTS FROM DISPENSARY AREAS.

In this chapter there is given in respect of each dispensary area a summary of the work done by the dispensary staff, the housing conditions of patients, and a report of the consultant tuberculosis officer.

## AREA No. 1.

*Lancaster, Chorley, Preston Rural, and Lytham St. Annes Districts.*

(Estimated population, 255,076.)

Consultant Tuberculosis Officer ... Dr. A. D. BRUNWIN.

Assistant Tuberculosis Officer ... Dr. G. H. LEIGH.

Number of tuberculous cases under supervision on 31st December, 1927  
(Definitely tuberculous, 1109 ; doubtful, 3.) ... 1112

Examinations by Tuberculosis Officer at—					Examinations of <i>new persons</i> and <i>new contacts</i> for diagnosis.	Re-visits or re-attendances of “ <i>old</i> ” cases and “ <i>old</i> ” <i>contacts</i> .
Patients' homes	...	...	...	...	259	1330
Lancaster Chief Dispensary	...	...	...	...	121	514
Chorley Branch Dispensary	...	...	...	...	167	819
Preston Branch Dispensary	...	...	...	...	92	362
					380	1695

## Attendances of patients at dispensaries for artificial light treatment—

Lancaster Dispensary	...	...	...	...	...	...	1172	} 4190
Chorley Dispensary	...	...	...	...	...	...	2818	
Preston Dispensary	...	...	...	...	...	...	200	

## Care committee meetings attended by—

(a) Tuberculosis officers	...	...	...	...	...	...	...	23
(b) Tuberculosis health visitors	...	...	...	...	...	...	...	30

Lectures or addresses given ... 1

Visits by tuberculosis officers to sanatoria, pulmonary and special hospitals... 21

Special visits by tuberculosis officers (*i.e.*, interviews with medical officers of health, general hospital officials, &c.) ... 6

## Visits by dispensary nurses to patients' homes—

Routine visits	...	...	...	...	...	...	3844	} 3882
Actual nursing	...	...	...	...	...	...	2	
Application of surgical dressings	...	...	...	...	...	...	11	
Adjustment of splints and surgical appliances	...	...	...	...	...	...	25	

Sanitary defects reported to the local medical officers of health ... 14

Sanitary defects which after notification were remedied ... 9

Disinfections carried out by local sanitary authorities ... 247

Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment ... 462

*Housing Statistics of Patients (applicants) in Area No. 1.*

		Patients Occupying Separate Bedroom.	Patients Occupying Separate Bed, but not Separate Bedroom.	Not Separate Bed.
Total number of Pulmonary cases <i>considered infectious</i> or <i>contagious</i> .	Under 15 years	1	—	2*
	15 and over ...	176	38	14*
Total number of Pulmonary cases <i>not</i> considered infec- tious or contagious.	Under 15 years	27	33	40
	15 and over ...	129	45	92
Total number of Non-Pul- monary cases.	Under 15 years	36	89	117
	15 and over ...	86	32	125
TOTAL ... ..		455	237	390

\* Of the 16 infective patients without a separate bed, 9 were isolated in sanatoria or pulmonary hospitals at the end of 1927.

Dr. Brunwin sends the following report on work done in this area :—

The work of the area has been extended as regards artificial light treatment for, in addition to Lancaster and Chorley, a new centre has been started at the Preston Dispensary, which is equipped with an “Alpine Sun” carbon arc lamp (consuming 20 amperes), a tungsten arc lamp (both lamps were previously in use at the Lancaster Dispensary), and a Kromayer water-cooled mercury vapour lamp.

The X-ray plant has been of great value in assisting in the diagnosis of doubtful and difficult cases.

A small number of artificial pneumothorax operations has been performed during the year, usually re-fills in cases returned from sanatoria. In a scattered area it is not possible to undertake this form of treatment on a big scale.

A very large number of old-standing cases have been visited during the year; many have had no sign of illness for more than five years and are fully employed—often in hard manual work. It has been possible as a result to write the majority of these off as “cured.”



## AREA NO. 2.

*Accrington, Bacup, Burnley Rural, Darwen, Nelson, and Rawtenstall Districts.*

(Estimated population, 355,674.)

Consultant Tuberculosis Officer ... Dr. B. MACPHEE.

Assistant Tuberculosis Officers ... Dr. S. C. ADAM.

Dr. F. C. S. BRADBURY.

Number of tuberculous cases under supervision on 31st December, 1927  
(Definitely tuberculous, 1035 ; doubtful, 14.) ... 1049

Examinations by Tuberculosis Officer at—					Examinations of <i>new persons</i> and <i>new contacts</i> for diagnosis.	Re-visits or re-attendances of " <i>old</i> " cases and " <i>old</i> " <i>contacts</i> .
Patients' homes	...	...	...	...	248	265
Accrington Chief Dispensary	...	...	...	...	278	650
Darwen Branch Dispensary	...	...	...	...	77	173
Nelson Branch Dispensary...	...	...	...	...	175	448
Stacksteads Branch Dispensary	...	...	...	...	90	331
					620	1602
Care committee meetings attended by tuberculosis health visitors					...	2
Lectures or addresses given					...	12
Visits by tuberculosis officers to sanatoria, pulmonary and special hospitals and poor law infirmaries					...	36
Special visits by tuberculosis officers ( <i>i.e.</i> , interviews with medical officers of health, general hospital officials, &c.)					...	23

*Housing Statistics of Patients (applicants) in Area No. 2.*

		Patients Occupying Separate Bedroom.	Patients Occupying Separate Bed, but not Separate Bedroom.	Not Separate Bed.
Total number of Pulmonary cases <i>considered infectious</i> or <i>contagious</i> .	Under 15 years	2	—	—
	15 and over ...	214	114	25*
Total number of Pulmonary cases <i>not</i> considered infec- tious or contagious.	Under 15 years	3	6	6
	15 and over ...	90	48	95
Total number of Non-Pul- monary cases.	Under 15 years	22	61	55
	15 and over ...	88	74	132
TOTAL		419	303	318

\* Of the 25 infective patients without a separate bed, 5 were isolated in sanatoria or pulmonary hospitals at the end of 1927.

Visits by dispensary nurses to patients' homes—										
Routine visits	...	...	...	...	...	...	...	7383	} 8286	
Actual nursing	...	...	...	...	...	...	...	339		
Application of surgical dressings	...	...	...	...	...	...	...	230		
Adjustment of splints and surgical appliances	...	...	...	...	...	...	...	334		
Patients' dispensary attendances for attention by nurses—										
Application of surgical dressings	...	...	...	...	...	...	...	47	} 63	
Adjustment of splints and surgical appliances	...	...	...	...	...	...	...	16		
Sanitary defects reported to the local medical officers of health							...	...	34	
Sanitary defects which after notification were remedied							...	...	26	
Disinfections carried out by local sanitary authorities—										
Rooms, 321, Articles, 1275	...	...	...	...	...	...	...	1596		
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment										684

### Dr. MacPhee reports :—

The X-ray work for the area is carried out at the dispensary, 20, Railway Road, Darwen, and during the year 655 skiagrams were taken. The use of X-rays in the diagnosis of tuberculosis is undoubtedly of very great assistance, and the more experienced one is in their use the more one is able to appreciate their value. They are also of great use in assisting one to arrive at a true picture of the actual condition in the lungs or joints.

It is unfortunate that, so far as this area is concerned, it has not been possible to secure new premises in Accrington for a chief dispensary. The present building is now hardly suitable on account of its limited accommodation in consequence of which we have not been able to install an X-ray apparatus or lamps for ultra-violet treatment. The X-ray work could be carried out more conveniently, both to myself and the patients, at Accrington which is more central.

Examinations of sputum are carried out at the laboratory at the Accrington Chief Dispensary. During the year 1,189 specimens were examined with the following results: Positive 221, negative 968. In certain special cases giving rise to difficulties in diagnosis specimens of sputum are sent to Manchester for guinea-pig inoculation tests.

Monthly visits have been made by myself, or Dr. Adam, to the Burnley Pulmonary Hospital and to the Eastby Sanatorium in order to confer with the medical superintendents as to the continuation or otherwise of treatment of County patients in the institution.

Treatment in a few cases by artificial pneumothorax was continued by Dr. Adam at the Accrington Dispensary with apparently satisfactory results.



The Care Committee in the Bacup and Rawtenstall area, and that in the Bromley Cross district, have continued their useful work.

The County Care scheme has again been of excellent service in assisting necessitous patients in those districts which do not possess a voluntary care committee, and during the year 65 individual patients or their dependents were assisted at a cost of £194 3s. 1d.

### AREA No. 3.

*Ashton-under-Lyne, Bury Rural, Chadderton, Crompton, Littleborough, Middleton, Mossley, &c., Districts.*

(Estimated population, 368,383.)

Consultant Tuberculosis Officer ... Dr. J. L. STEWART.

Assistant Tuberculosis Officers ... Dr. G. FLETCHER and Dr. C. BERRY.

Number of tuberculous cases under supervision on 31st December, 1927  
(Definitely tuberculous, 1781 ; doubtful, 1.) ... .. 1782

Examinations by Tuberculosis Officer at—						Examinations of <i>new persons</i> and <i>new contacts</i> for diagnosis.	Re-visits or re-attendances of “ <i>old</i> ” cases and “ <i>old</i> ” contacts.
Patients' homes	...	...	...	...	...	159	362
Ashton-under-Lyne Chief Dispensary	...	...	...	...	...	514	2328
*Bury Branch Dispensary	...	...	...	...	...	190	850
Middleton Branch Dispensary	...	...	...	...	...	82	478
Mossley Branch Dispensary	...	...	...	...	...	36	210
Oldham Branch Dispensary	...	...	...	...	...	255	1255
Rochdale Branch Dispensary	...	...	...	...	...	129	555
						1206	5676

\* Transferred to 41, Darbyshire Street, Radcliffe, 2nd May, 1928.

Attendances of patients at the Ashton-under-Lyne Dispensary for artificial light treatment	...	...	...	...	...	...	...	9710
Care committee meetings attended by—								
(a) Tuberculosis officers	...	...	...	...	...	...	...	7
(b) Tuberculosis health visitors	...	...	...	...	...	...	...	9
Lectures or addresses given	...	...	...	...	...	...	...	4
Visits by tuberculosis officers to sanatoria, pulmonary and special hospitals and poor law infirmaries	...	...	...	...	...	...	...	76
Special visits by tuberculosis officers ( <i>i.e.</i> , interviews with medical officers of health, general hospital officials, &c.)	...	...	...	...	...	...	...	10
Visits by dispensary nurses to patients' homes—								
Routine visits	...	...	...	...	...	...	9690	10506
Actual nursing	...	...	...	...	...	...	226	
Application of surgical dressings	...	...	...	...	...	...	52	
Adjustment of splints and surgical appliances	...	...	...	...	...	...	538	
Patients' dispensary attendances for attention by nurses—								
Application of surgical dressings	...	...	...	...	...	...	124	158
Adjustment of splints and surgical appliances	...	...	...	...	...	...	34	

Sanitary defects reported to the local medical officers of health ... ..	140
Sanitary defects which after notification were remedied ... ..	76
Disinfections carried out by local sanitary authorities ... ..	489
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment ...	904

*Housing Statistics of Patients (applicants) in Area No. 3.*

		Patients Occupying Separate Bedroom.	Patients Occupying Separate Bed, but not Separate Bedroom.	Not Separate Bed.
Total number of Pulmonary cases considered infectious or contagious.	Under 15 years	—	—	1*
	15 and over ...	259	121	28*
Total number of Pulmonary cases not considered infec- tious or contagious.	Under 15 years	5	28	43
	15 and over ...	185	153	206
Total number of Non-Pul- monary cases.	Under 15 years	12	118	130
	15 and over ...	88	127	254
TOTAL ... ..		549	547	662

\* Of the 29 infective patients without a separate bed, 6 were isolated in sanatoria or pulmonary hospitals at the end of 1927.

**Dr. Stewart reports :—**

The voluntary care committees at Ashton-under-Lyne and Radcliffe have done excellent work throughout the year. Both committees have interested themselves in the County scheme for the treatment of non-pulmonary tuberculosis by artificial light. The Ashton-under-Lyne Committee have recently decided to provide a Sollux lamp in addition to the carbon arc lamp and Kromayer lamp previously given by them for use at the chief dispensary. The Radcliffe Committee have decided to give two lamps (one Jesionek and one Sollux) for use at the Radcliffe Dispensary, in addition to the lamps provided by the County Council. We are greatly indebted to these two Committees for their valuable help and willing co-operation in the work.

Necessitous cases in other parts of the area are assisted through the County Care Fund, which has been of great value. During the year 45 patients or their dependents were assisted at an approximate cost of £193.

The X-ray work for the area is carried out at Ashton Dispensary, and during the year 1,792 skiagrams were taken. The value of this method in the diagnosis, etc., of tuberculosis is now more fully recognised, and it has become an indispensable aid in the routine work of the dispensary.



Lectures on the value of radiography in the diagnosis of pulmonary tuberculosis have been given by me to the Oldham Medical Society, the Ashton-under-Lyne Branch of the British Medical Association and the Southport Medical Society.

The post-graduate course on X-ray work at the Victoria Hospital, London, which I attended along with some of my colleagues, proved to be most interesting and valuable.

The bacteriological work of the area is carried out in the laboratory at the chief dispensary. During the year 1,398 specimens were examined with the following results: Positive 331, negative 1,067.

Periodical visits have been made to the Meathop Sanatorium, King Edward VII. Hospital, Sheffield, and the following pulmonary hospitals: Marland, Wolstenholme Hall, Chaderton and Westhulme. Occasional visits have also been made to the Union Hospital, Ashton-under-Lyne, in order to see patients in consultation with the medical superintendent there.

The co-operation of the Guardians in the work in the Ashton-under-Lyne district has been of great assistance and is much appreciated.

The artificial light department at Ashton-under-Lyne Dispensary has been kept fully extended throughout the year. The results are referred to in the special chapter IV on light treatment.

The opening of the light centre at the Radcliffe Dispensary will be a valuable addition to the facilities for treatment in the area. It will relieve the strain on the Ashton Dispensary and will lessen the distance which many patients have to travel at present in order to receive the treatment.

I wish to acknowledge the very valuable assistance given throughout the year by the medical, nursing and clerical members of the staff in Area No. 3.

#### AREA No. 4.

*Leigh, Eccles, Farnworth, Stretford, and Swinton Districts.*

(Estimated population, 342,606.)

Consultant Tuberculosis Officer ...	Dr. G. JESSEL
Assistant Tuberculosis Officers ...	Dr. A. B. JAMIESON
	Dr. J. CATHCART

Number of tuberculous cases under supervision on 31st December, 1927					
(Definitely tuberculous, 1699 ; doubtful, 7.)	...	...	...	...	1706

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Examination by Tuberculosis Officer at—	Examinations of <i>new persons</i> and <i>new contacts</i> for diagnosis.	Re-visits or re-attendances of " <i>old</i> " cases and " <i>old</i> " contacts.
Patients' homes ... ..	258	1230
Leigh Chief Dispensary ... ..	239	1305
Eccles Branch Dispensary ... ..	131	715
Farnworth Branch Dispensary ... ..	165	1007
Pendlebury Branch Dispensary ... ..	106	717
Stretford Branch Dispensary ... ..	149	731
	<u>790</u>	<u>4475</u>
Attendances of patients at the Eccles Dispensary for artificial light treatment (December 1st to 31st) ... ..		422
Care committee meetings attended by—		
(a) Tuberculosis officers ... ..		36
(b) Tuberculosis health visitors ... ..		46
Lectures or addresses given ... ..		4
Visits by tuberculosis officers to sanatoria, pulmonary and special hospitals, and poor law infirmaries ... ..		44
Special visits by tuberculosis officers ( <i>i.e.</i> , interviews with medical officers of health, general hospital officials, &c.) ... ..		23
Visits by dispensary nurses to patients' homes—		
Routine visits ... ..		9748
Actual nursing ... ..		159
Application of surgical dressings ... ..		236
Adjustment of splints and surgical appliances ... ..		706
Patients' dispensary attendances for attention by nurses—		
Application of surgical dressings ... ..		688
Adjustment of splints and surgical appliances ... ..		15
Sanitary defects reported to the local medical officers of health ... ..		33
Sanitary defects which after notification were remedied ... ..		21
Disinfections carried out by sanitary authorities ... ..		551
Cases referred by medical practitioners, Pensions authorities, &c., to tuber- culosis officer for an opinion as to diagnosis or treatment ... ..		681

*Housing Statistics of Patients (applicants) in Area No. 4.*

	Patients Occupying Separate Bedroom.	Patients Occupying Separate Bed, but not Separate Bedroom.	Not Separate Bed.
Total number of Pulmonary } Under 15 years cases <i>considered infectious</i> or <i>contagious</i> . } 15 and over ...	2 270	2 86	1* 19*
Total number of Pulmonary } Under 15 years cases <i>not</i> considered infec- } tious or contagious. } 15 and over ...	8 228	23 111	22 212
Total number of Non-Pul- } Under 15 years monary cases. } 15 and over ...	54 118	113 89	126 215
TOTAL ... ..	680	424	595

\* Of the 20 infective patients without a separate bed, 11 were isolated in sanatoria or pulmonary hospitals at the end of 1927.



Dr. Jessel reports :—

The dispensary activities have been fully maintained and in some directions extended. A more systematic use has been made of the X-ray apparatus, and on the 1st December a beginning was made with artificial light therapy. A reduction in the number of cases under dispensary supervision from 1,908 to 1,706 has, in the circumstances, been fortunate, thereby enabling the existing medical staff to undertake the additional work. An extra nurse, to attend to the "light" cases, was, however, found necessary. Care has been taken to see that the balance was fairly held between the various dispensary activities, so that the end might not be lost sight of in the means, and fundamentals not neglected in the pursuit of some particularly interesting branch of work. It is pleasant to recall the zeal and discretion with which the dispensary staff have performed their duties.

*Diagnosis.* New cases examined, excluding contacts, numbered 863. Of these, 681 or 78·9 per cent. were specially referred to me by medical practitioners; the remaining 182 were examined after notification. Two hundred and ten new cases, who were unfit to attend dispensaries, were examined at their homes, and in 157 or 74 per cent. the patient's medical attendant was present at the examination. It is thus reasonable to conclude that there is close co-operation between the medical practitioners of the area and the dispensary.

Apart from thorough clinical examinations, repeated where necessary and regarded as our sheet-anchor in diagnosis, all other available adjuncts were fully utilised. These include :—

(a) *Sputum Examinations.* At the Eccles Dispensary 1,704 specimens were examined, of which 257 were found to contain tubercle bacilli. Specimens numbering 337 were examined at the request of medical practitioners and tubercle bacilli were found in 50 of these, but medical men are encouraged to refer the patients for full investigation, rather than to rely upon a single sputum examination. As a matter of fact, it is the dispensary custom, in doubtful cases, to distribute outfits in batches of two or three, as not infrequently tubercle bacilli are found in only one of the series.

(b) *X-ray Examinations.* During the year 745 skiagrams were taken, as compared with 485 in 1926, as many new cases as possible visiting the Eccles Dispensary for the purpose. An additional record of the condition of patients is thus available, and is interpreted in conjunction

with the other evidence. In the absence of post-mortem facilities, X-ray examination provides a useful stimulus for the maintenance of clinical skill and judgment at a high level.

At the end of the year seven cases only were awaiting a definite diagnosis.

*Treatment.* No routine treatment was provided at dispensaries, this being obtainable from private practitioners. A good deal of help was given, however, at patients' homes through the dispensary nurses, who not only systematically instructed patients in the necessary requirements of the home hygiene, but undertook such nursing and dressings as were needed. The regular visiting of active and especially of infectious cases is of incalculable benefit, not only to the patient but to the family, through the efforts made to prevent the spread of infection.

At the dispensaries special forms of treatment were regularly undertaken. These included aspirations of abscesses, application of plasters, artificial pneumothorax refills, etc. At patients' homes, extension and other apparatus, supplied from the dispensaries, were applied from time to time by the tuberculosis officers and dispensary nurses. Special attention has also been given during the past year to skin cases, and as local treatments were begun at dispensaries the necessity for patients to travel to Manchester for the purpose was removed in many instances.

*Artificial Light.* Two 30-ampere carbon arc lamps and a Kromayer mercury vapour lamp were installed at the Eccles Dispensary in time to enable ultra-violet treatment to be begun on the 1st December. A start was made with cases of lupus, scrofulous conditions and discharging sinuses, forty patients being under treatment at the end of the year.

*Care Work.* The Care Committees of Leigh, Farnworth, and Westhoughton, together with the tuberculosis sections of the Eccles and Stretford Guilds of Help, assisted 136 patients during the year at a cost of £365 11s. 11d. while 14 other patients were helped at a cost of £28 3s. 6d. from the County Care Fund, available in districts where no voluntary care organisation exists.

*Contacts.* The examination of 185 selected contacts resulted in 14 definite cases being found.

*Visits to Institutions.* Apart from the almost daily visits to the Peel Hall Pulmonary Hospital in the area (see report on page 99), visits were paid monthly to the Wilkinson Sanatorium and the Townley's Poor-law Hospital, and quarterly to the



Children's Hospitals at Leasowe, Heswall, West Kirby, and Thingwall for the purpose of conferring with the medical officers of these institutions respecting the continued treatment of County patients therein.

### AREA No. 5.

*Seaforth, Hindley, Ince, Newton-in-Makerfield, Warrington Rural, West Lancashire Rural, Whiston Rural, Wigan Rural, and Widnes Districts.*

(Estimated population, 378,948.)

Consultant Tuberculosis Officer	...	Dr. C. W. LAIRD.
Assistant Tuberculosis Officers	...	Dr. C. H. LILLEY. Dr. G. B. CHARNOCK.

Number of tuberculous cases under supervision on 31st December, 1927	
(Definitely tuberculous, 1980; doubtful, 36.)	... 2016

Examinations by Tuberculosis Officer at—					Examinations of new persons and new contacts for diagnosis.	Re-visits or re-attendances of "old" cases and "old" contacts.
Patients' homes	...	...	...	...	319	1052
Seaforth Chief Dispensary	...	...	...	...	228	1250
*St. Helens Branch Dispensary	...	...	...	...	124	638
Widnes Branch Dispensary	...	...	...	...	203	1486
Wigan Branch Dispensary	...	...	...	...	297	1493
					852	4867

\* New premises at 90, Hardshaw Street, St. Helens, were opened on 1st June, 1927.

Care committee meetings attended by—

(a) Tuberculosis officers	...	...	...	...	...	...	21
(b) Tuberculosis health visitors	...	...	...	...	...	...	48

Visits by tuberculosis officers to sanatoria, pulmonary and special hospitals, and poor law infirmaries	...	...	...	...	...	...	29
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Special visits by tuberculosis officers ( <i>i.e.</i> , interviews with medical officers of health, general hospital officials, &c.)	...	...	...	...	...	20
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Visits by dispensary nurses to patients' homes—

Routine visits	...	...	...	...	...	7043	} 8152
Actual nursing	...	...	...	...	...	190	
Application of surgical dressings	...	...	...	...	...	465	
Adjustment of splints and surgical appliances	...	...	...	...	...	454	

Patients' dispensary attendances for attention by nurses—

Application of surgical dressings	...	...	...	...	1024	} 1059
Adjustment of splints and surgical appliances	...	...	...	...	35	

Sanitary defects reported to the local medical officers of health	...	...	108
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Sanitary defects which after notification were remedied	...	...	67
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Disinfections carried out by local sanitary authorities	...	...	502
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Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment	...	...	824
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*Housing Statistics of Patients (applicants) in Area No. 5.*

		Patients Occupying Separate Bedroom.	Patients Occupying Separate Bed, but not Separate Bedroom.	Not Separate Bed.
Total number of Pulmonary cases <i>considered infectious or contagious.</i>	Under 15 years	—	4	1*
	15 and over ...	223	89	41*
Total number of Pulmonary cases <i>not</i> considered infectious or contagious.	Under 15 years	22	69	89
	15 and over ...	197	155	294
Total number of Non-Pulmonary cases.	Under 15 years	25	170	229
	15 and over ...	71	90	211
TOTAL ... ..		538	577	865

\* Of the 42 infective patients without a separate bed, 12 were isolated in sanatoria or pulmonary hospitals at the end of 1927.

Dr. Laird reports :—

During the year greater activity was manifest in almost every branch of our work in the area. The opening of a new dispensary at St. Helens constituted an advance in providing quarters more suitable for the needs of County cases. Later in the year, at the new dispensary, a centre was established for the treatment of non-pulmonary disease by artificial light.

Dispensary sessions were more numerous, and attendance at the various centres was satisfactory. There was a very definite increase in the amount of radiological work undertaken at the chief dispensary at Seaforth, where most of the X-ray examinations and all the clerical duties are performed. This increase, amounting to 25 per cent., can be attributed to the growing tendency to have every new case so investigated as a matter of routine, when such procedure is practicable. Much of the additional demand came from the district around Wigan which became part of Area 5 early in 1926 by transfer from Area 4.

Several patients have had artificial pneumothorax treatment continued at the dispensary.

Bacteriological examinations of sputum were made at the chief dispensary to the number of 874, and positive results were obtained in 204. Skiagrams totalled 600, and screenings 218.

Nursing requisites such as air cushions, bed rests, bed pans, sputum cups and paper handkerchiefs were issued on loan to patients as in other years, and in some cases single beds and mattresses were similarly provided in order to secure better



sleeping accomodation for infective persons. Sleeping shelters also were supplied for the same purpose, as well as for treatment, where ground was available for their erection at the patients' homes.

The area is now partially covered by six voluntary care committees, one in Widnes having been added to the previous number, largely owing to the interest of the Widnes Social Service and the initiative of Mrs. A. E. Edwards, J.P., who is now the energetic honorary secretary of the new committee. Of the other committees, that for Huyton and Roby alone found no occasion for expenditure. The voluntary committees for the Wigan County district, Golborne, Earlestown, Newton and district, and Prescot and neighbourhood are actively engaged in carrying out useful work as heretofore. The voluntary efforts of those who serve on these organisations and the support accorded to them by private persons and associations of employers, public bodies, societies and clubs are duly appreciated and gratefully acknowledged on behalf of those for whose assistance they have been constituted—the more necessitous sufferers from tuberculosis in the several districts concerned.

Attention is here drawn to the occurrence of cases of pulmonary tuberculosis, often of the severe type, with laryngeal complications, amongst persons engaged in public houses, either in a menial or a managerial capacity. In statistical tables of comparative occupational mortality these groups—especially the employees—occupy a premier place, and even my own limited experience leads me to suspect that much infection occurs in licensed houses, particularly those of the suburban and rural type where the “snuggery” is a feature, and the stale, musty smell of the bar parlour conveys a warning to the wary. The spittoon, as an element of danger, has been too long ignored. It is presumably a survival from earlier times when to smoke was a manly attribute, and to spit at intervals when smoking was considered manlier still. As a potential factor in the spread of infection, this hygienic abomination, this relic of a bygone age, has claims almost too obvious to require elaboration : much of what the receptacle is intended to intercept escapes it entirely : its exterior as well as its interior is fouled, and so too is its immediate vicinity. Sometimes it is partly filled with water ; at other times with sawdust. Sometimes it is emptied, sometimes even rinsed ; occasionally it has fresh sawdust scattered over the old ; but rarely, if ever, is it thoroughly disinfected. Surely it were better abolished altogether.

Nowadays spitting is an offence against public health, if not against public decency, and as such, in many places it is punishable by penalty. Spitting is not a necessary concomitant of the smoking of tobacco.

There are other matters in connection with public bars which call for comment, such as the careless or perfunctory cleansing of vessels in which drink is served. The practice followed in this respect varies in different places within fairly wide limits; but, assuming that consumptives are occasionally, if not frequently, amongst the habitués of these establishments, the need for some form of adequate disinfection is of importance and can be readily understood. The use of disinfectants in the washing of floors, the admission of fresh air and sunlight, the maintenance of cleanliness, and the protection of cleaners and servers from adverse influences, are all points deserving of further attention.

In regard to these things, it is suggested that concerted action by medical officers of health and co-operation of lessees and proprietors, as well as of the public themselves in their own interest, might go far to ameliorate existing conditions, and, by diminishing a real cause of disease, might also help to promote its ultimate prevention. To those who may be in a position to supplement these observations, either by reason of a more intimate knowledge of the conditions than I can be expected to possess, or from some different cause, I commend the subject for their further consideration.

## FURNESS SUB-AREA.

*Dalton-in-Furness, Grange-over-Sands, Ulverston, and  
Ulverston Rural Districts.*

(Estimated population, 39,328.)

Consultant Tuberculosis Officer ... Dr. E. H. ALLON PARK.

Number of tuberculous cases under supervision on 31st December, 1927					
(Definitely tuberculous, 374; doubtful, —.)					
...	...	...	...	...	874

Examinations by Tuberculosis Officer at—	Examinations of <i>new persons</i> and <i>new contacts</i> for diagnosis.	Re-visits or re-attendances of “ <i>old</i> ” <i>cases</i> and “ <i>old</i> ” <i>contacts</i> .
Patients' homes ... ..	72	192
Ulverston Branch Dispensary ... ..	92	838
Visits by tuberculosis officer to sanatoria, pulmonary and special hospitals and poor-law infirmaries ... ..	...	...
Routine visits by dispensary nurse to patients' homes ... ..	...	...
Sanitary defects reported to local medical officers of health ... ..	...	...
		18
		2663
		9



Sanitary defects which after notification were remedied	...	...	...	9
Disinfections carried out by local sanitary authorities	...	...	...	88
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment	...	...	...	100

*Housing Statistics of Patients (applicants) in Furness Sub-Area.*

	Patients Occupying Separate Bedroom.	Patients Occupying Separate Bed, but not Separate Bedroom.	Not Separate Bed.
Total number of Pulmonary cases <i>considered infectious or contagious.</i> { Under 15 years 15 and over ...	1 34	1 6	— 10*
Total number of Pulmonary cases <i>not</i> considered infectious or contagious. { Under 15 years 15 and over ...	18 78	39 12	12 85
Total number of Non-Pulmonary cases. { Under 15 years 15 and over ...	6 28	14 7	11 12
TOTAL ... ..	165	79	130

\* Of the 10 infective patients without a separate bed, 2 were isolated in sanatoria or pulmonary hospitals at the end of 1927.

Dr. Pask sends the following report on the work done in this sub-area :—

The work in the Furness Sub-Area does not appear to diminish. The attendance of patients at the Ulverston Dispensary continues to be very good, and patients who live considerable distances away are now very regular in presenting themselves for examination ; this is accounted for by bus services in operation to the surrounding villages.

The number of contacts presenting themselves for examination is a gratifying feature. During the year 52 new contacts were examined, as against 38 for the preceding year. There is not the same amount of difficulty in getting contacts to attend as there used to be. In the country districts in the past there was a certain amount of dread of the tuberculosis officer, but this is now rapidly disappearing, and frequently persons who have been in contact with a case of tuberculosis present themselves for examination without a previous visit from the nurse.

Housing defects are now remedied earlier than formerly, and frequently these have been put right before the matter has been reported to the local sanitary authority.

The closest co-operation is maintained with Dr. Patterson, the medical officer of health. The fact that the tuberculosis dispensary is housed in the same building as the health office is a considerable asset, as notifications can be dealt with immediately. Other matters that arise from time to time can also be dealt with promptly, and thus the closest liaison is maintained.

The amount of tuberculosis in the area is still unfortunately very considerable, and it has the unenviable reputation of being the worst in the County. The following table shows the death-rates from pulmonary and non-pulmonary tuberculosis in the four sanitary districts comprising the Furness Sub-Area :—

*Tuberculosis Death-Rates per 1,000 of the Population.*

Sanitary District	Estimated Population 1927	Pulmonary Tuberculosis			Non-Pulmonary Tuberculosis		
		1917-1921 5 year average	1922-1926 5 year average	1927	1917-1921 5 year average	1922-1926 5 year average	1927
Dalton-in-Furness	11,030	1.36	1.13	1.54	0.47	0.22	0.27
Grange-over-Sands	2,242	0.73	0.67	0.89	0.22	0.39	—
Ulverston Urban	9,406	0.60	0.72	0.21	0.32	0.31	0.10
Ulverston Rural	16,650	0.79	0.45	0.90	0.23	0.16	0.06
Administrative County ..	1,800,300	0.87	0.69	0.61	0.24	0.20	0.16

These figures show that the Urban District of Dalton-in-Furness has about double the death-rate from pulmonary tuberculosis compared with any other district, and also has a non-pulmonary rate much above the general County average.

There is no question that in Dalton-in-Furness the economic conditions have been very bad. There has been a large amount of unemployment and, further, there is little opportunity for an adolescent to obtain work on leaving school. The district differs a great deal from the cotton towns in that there is no occupation open for women except domestic service. The rainfall in the locality in 1927 was 56.52 inches which is above the average. The prevailing wind is south-westerly. With regard to the housing, the Census for 1921 shows that in houses of 1 to 9 rooms there were in Dalton-in-Furness 1.09 rooms per person, which is slightly better than the average of 1.07 for the Administrative County. This is confirmed by the home conditions as reported by the tuberculosis health visitor, as in only 7 households out of 96 new cases reported in 1925—1927 was there overcrowding. In regard to cleanliness, the tuberculosis health visitor's report showed that in 9 households of the 96 the condition was unsatisfactory.



The hematite ore industry in the Furness area was the staple industry of the district 20 or 30 years ago and employed several thousand men ; the industry gradually became less active owing to the mines being worked out. At the outbreak of war there was an increased demand for iron ore, many of the disused mines were opened again and probably 2,000 men were employed ; after the war some of the mines were closed down again gradually, the number of men employed became less by degrees, but quite a lot, however, were kept on. Some of the less remunerative mines were closed down only three or four years ago.

The industry at present does not absorb more than 600 men, and these are employed at three mines (Roanhead, Anticross, and Newton). The hematite ore is found in seams between limestone ; it is of a fairly soft and moist character, and contains silica in varying amounts from 6 to 30 per cent. The depth of the seams from the surface varies somewhat, the shallower ones being 60 yards and some of the deeper ones being up to 250 yards. The men are let down by means of cages carrying about four men. It is not a dusty occupation, the condition of the mines generally being damp ; pumping apparatus is employed to get rid of the water. In the winter time water collects on the floor of the mines, but it is not usual for men to be working in water.

The number of iron ore miners on the tuberculosis register in 1927 is 16. This would appear rather a large percentage when one considers the number (600) at present employed, but a large proportion of these men were taken on the register several years ago when the industry was more prosperous and about 1,000 employed in the industry. Nine miners were taken on the register in 1922 or before. On the whole it would appear the incidence of pulmonary tuberculosis among these miners is not unduly large.

There are slate quarries in the Kirkby district where about 140 men are employed ; five of these men are on the register suffering from pulmonary tuberculosis. The figures for this occupation are worse than for the iron ore miners, but it is however extremely difficult to draw definite conclusions from such small numbers. One of the slate quarrymen is a member of a family in which five had died of pulmonary tuberculosis in the last twelve months, and two more are brothers, so that the family history is the most important factor in these cases.

From time to time a considerable number of men have emigrated to South Africa to work in the gold mines there, and quite a good proportion have returned with silicosis. Not a

very large percentage developed actual tuberculosis ; there are four cases of pulmonary tuberculosis on the books from this source.

An investigation of the new cases of tuberculosis in Dalton-in-Furness during 1925, 1926, and 1927 showed that of 96 new cases 64 were pulmonary and 32 non-pulmonary. Of the pulmonary cases, 29 were adult males, 22 adult females, and 13 children. In 26 instances of these 64 pulmonary cases (equals 40 per cent.) there had been a previous known case of tuberculosis in the family or in the house within five years. For the 32 non-pulmonary cases there was a similar history of tuberculosis in the household in 13 instances (equals 40 per cent.).

When compared with the remainder of the County, the relationship to known cases in the household is high, the County average being about 31 per cent. for pulmonary cases and 21 per cent. for non-pulmonary cases.

To sum up, the primary cause for the very high incidence rate in Dalton is not yet established beyond doubt. The silica in the hematite ore mines does not appear to be a factor, because Dr. Pask does not see any cases of silicosis arising in his area as the result of work in the hematite ore mines. About 30 per cent. of all trades and work in Dalton are, or rather were, at shipyards in Barrow-in-Furness. Depression has been acute, as everyone knows, in shipbuilding and also in the iron ore mines previously referred to, and it would appear that the poverty resulting from very acute depression in these two industries is the most important cause of the high incidence of tuberculosis in the Furness Sub-Area. In support of this it may be stated that the deaths from pulmonary tuberculosis, during the past seven years, occurred, as between males and females, in almost the same proportion in Dalton-in-Furness (47 per cent. of deaths being females) as in the whole Administrative County (46 per cent. females). The death-rate from all causes has been appreciably higher in Dalton than in the County during the past seven years—14.2 per 1,000 of the population, as against 12.5 for the County.

In June, 1928, artificial light treatment will be commenced at the dispensary.

The number of sputum examinations made at the High Carley Sanatorium for dispensary patients was 157. The X-ray examinations of dispensary patients numbered 327, as compared with 233 last year.



The number of statutory notifications of new cases of tuberculosis was 97, the same number as last year.

There were 14 cases assisted through the County Care scheme, and the amount expended was £30 5s. 6d.

## FYLDE SUB-AREA.

*Fleetwood, Fylde Rural, Garstang Rural (part of), Kirkham, Poulton-le-Fylde, Preesall, and Thornton Districts.*

(Estimated population, 60,285.)

Consultant Tuberculosis Officer ... Dr. G. LEGGAT.

Number of tuberculous cases under supervision on 31st December, 1927					
(Definitely tuberculous, 367; doubtful, 2.)					
...	...	...	...	...	369

Examinations by Tuberculosis Officer at—	Examinations of <i>new persons</i> and <i>new contacts</i> for diagnosis.	Re-visits or re-attendances of “ <i>old</i> ” cases and “ <i>old</i> ” contacts.	
Patients' homes ... ..	72	184	
Fleetwood Branch Dispensary ... ..	116	691	
Visits by tuberculosis officer to sanatoria, pulmonary and special hospitals, and poor law infirmaries ... ..	...	...	9
Visits by dispensary nurse to patients' homes—			
Routine visits ... ..	...	2092	} 2170
Actual nursing ... ..	...	16	
Application of surgical dressings ... ..	...	16	
Adjustment of splints and surgical appliances ... ..	...	46	
Patients' dispensary attendances for attention by nurse—			
Application of surgical dressings ... ..	...	...	24
Sanitary defects reported to local medical officers of health ... ..	...	...	18
Sanitary defects which after notification were remedied ... ..	...	...	11
Disinfections carried out by local sanitary authorities ... ..	...	...	72
Cases referred by medical practitioners, Pensions authorities, &c., to tuber- culosis officer for an opinion as to diagnosis or treatment ... ..	...	...	138
<i>Housing Statistics of Patients (applicants) in Fylde Sub-Area.</i>			

					Patients Occupying Separate Bedroom.	Patients Occupying Separate Bed, but not Separate Bedroom.	Not Separate Bed.
Total number of Pulmonary cases <i>considered infectious or contagious.</i>	Under 15 years	15 and over	...	...	—	—	—
					35	9	7*
Total number of Pulmonary cases <i>not</i> considered infectious or contagious.	Under 15 years	15 and over	...	...	8	9	9
					35	34	60
Total number of Non-Pulmonary cases.	Under 15 years	15 and over	...	...	9	42	33
					18	17	42
TOTAL	...	...	...	...	105	111	151

\* Of the 7 infective patients without a separate bed, 1 was isolated in a sanatorium at the end of 1927.

Dr. Leggat reports :—

It has become increasingly evident that the medical practitioners of the district are taking full advantage of the facilities offered by the dispensary, and throughout the year the sessions have been very well attended.

Like much property in Fleetwood, the dispensary premises did not escape the disastrous flood which occurred during the unprecddented gale of October last, though fortunately no very serious damage was done to the building, and with the prompt help of the County Architect's department it was found possible to resume the full dispensary sessions and routine within two weeks.

Owing to the popularity of the Fylde during holiday seasons, a fair number of the migratory type of tubercular patients came in to the area during the year.

All X-ray examinations have been carried out at the Elswick Sanatorium. The total number of skiagrams taken of dispensary cases was 128, and 44 screen examinations were made.

Examinations of sputum, too, were undertaken at the sanatorium laboratory—the total for the year being 151, giving the following results : Positive 30, negative 121.

The County Care Fund has again proved of great benefit in the assisting of necessitous cases, especially in helping wives and families of male patients away in sanatoria and pulmonary hospitals.

Full and cordial co-operation has been maintained with all doctors, medical officers of health, and school medical officers.

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## XI.—CARE WORK.

The policy of the County Council in regard to care work and the establishment of voluntary care committees was fully dealt with in the report for 1924.

### THE VOLUNTARY CARE COMMITTEES.

A new voluntary committee was formed at Widnes in November, 1927, and there were at the end of the year 19 committees recognised by the County Council, the whole covering an estimated population of 843,717 out of an estimated County population of 1,800,300.

Particulars of the populations served, the number of patients assisted, and the amounts expended during 1927 are as follow :—

TABLE 18.—*Summary of Work done by Voluntary Care Committees.*

Name of Committee.	Estimated Population Served 1927.	Number of Individual Patients Assisted during 1927.	Expenditure during 1927.		
			£	s.	d.
Ashton-under-Lyne and District...	68,031	68	296	0	6
Bacup and Rawtenstall ... ..	49,420	28	24	19	1
Chorley and District ... ..	73,129	40	222	5	10
Earlestown, Newton and District ...	22,483	36	116	13	7
Eccles Guild of Help ... ..	45,390	8	9	15	0
Egerton, Eagley and District ... ..	5,759	1	3	0	6
Farnworth and District ... ..	70,312	31	111	0	6
Golborne ... ..	7,512	11	33	16	5½
Horwich ... ..	16,440	15	132	8	7
Huyton-with-Roby District ... ..	5,255	—	—	—	—
Lancaster and District ... ..	80,629	22	110	0	11
Leigh and District... ..	89,744	68	164	18	4
Prescot and District ... ..	21,456	18	67	11	3
Prestwich ... ..	21,120	5	29	18	0
*Radcliffe, Whitefield and District					
Relief Fund ... ..	35,470	21	190	9	10
Stretford Guild of Help ... ..	51,540	15	50	0	0
Westhoughton ... ..	17,670	14	29	18	1
†Widnes ... ..	42,610	—	—	—	—
Wigan County District ... ..	119,747	99	104	17	8½
<b>TOTAL ... ..</b>	<b>843,717</b>	<b>500</b>	<b>1697</b>	<b>14</b>	<b>2</b>

\* Relates to year ended 31st March, 1928.

† Formed November, 1927.

The County Council has continued to make a grant of  $33\frac{1}{3}$  per cent. of the committees' expenditure on actual assistance to patients.

The annual reports and balance sheets of the various committees are considered by the County Tuberculosis Committee of the County Council, who have expressed their earnest appreciation of the valuable voluntary work carried out. The Ashton-under-Lyne and District Committee and the Radcliffe, Whitefield and District Relief Fund Committee have kindly presented auxiliary lamp equipment for use in connection with artificial light treatment at the Ashton and Radcliffe dispensaries.

In addition to the 19 voluntary care committees approved by the County Council, there are in existence many charitable and other organisations to which the tuberculosis officers are able to refer necessitous cases. For ex-service men there are two organisations, namely : (a) the Joint Council of the Order of St. John of Jerusalem and the British Red Cross Society, which deals mainly with tuberculous pensioners, and (b) the Council of Management of the United Services Fund, which mainly looks after the interests of those tuberculous men who are *not* in receipt of war pensions.

The Ministry of Health, in a circular issued in December, 1923, laid down a scheme for co-operation between the managers of the various employment exchanges of the Ministry of Labour and the tuberculosis officers with regard to the employment in suitable occupations of male patients on discharge from sanatoria or hospitals. With the present large amount of unemployment in the country, there has been little opportunity for the scheme to show good results.

#### CARE WORK THROUGH DISPENSARY ORGANISATION.

The voluntary care committees only cover a little less than half the County, and there is left a balance of nearly 1,000,000 persons to be dealt with by other means, pending the formation of new voluntary committees. In the areas without care committees the County Council charged the tuberculosis dispensary staff with the duty of carrying out the relief work.

With regard to finance, the Council decided to take as a basis the amount voted to the voluntary Committees and in proportion to population to grant a similar sum for the relief of patients in the remainder of the County area. Thus the Council's expenditure on care work is fairly evenly distributed throughout the County, the districts where there are voluntary committees at work having the advantage of the additional funds obtained by them from outside sources.



Grants to necessitous patients or their dependants are made by the consultant tuberculosis officers by means of written orders on tradesmen in accordance with certain general conditions laid down by the County Council. The tuberculosis officers report that the scheme is working very satisfactorily and assisting materially in aiding patients to undergo treatment.

During 1927, assistance was afforded through the dispensary staff to 190 individual patients, the amount expended being £646 2s. 5d. The assistance was mainly in the provision of milk, groceries, and clothing.

The whole Administrative County is therefore covered by a complete and comprehensive care scheme.

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## XII.—COUNTY SANATORIA AND HOSPITALS.

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### (1) HIGH CARLEY SANATORIUM, NEAR ULVERSTON.

#### *Medical Superintendent :*

E. H. Allon Pask, M.D. (Lond.), L.R.C.P. (Lond.), M.R.C.S. (Eng.).

#### *Assistant Medical Superintendent :*

Henry J. Villiers, L.R.C.P.I., L.R.C.S.I.

#### *Matron :* Miss E. Wooséy.

High Carley Sanatorium is situated about three miles west of Ulverston, to the south of the main road to Barrow-in-Furness. The buildings stand in about 23 acres of ground, and accommodation at the end of the year was provided for 112 patients (62 males and 50 females).

The medical superintendent and the assistant are accommodated on the estate ; and seven houses are provided in the vicinity of the sanatorium for the male employees.

Particular attention is paid to the employment of suitable cases on some purposeful and constructive work in order chiefly to occupy the minds of the patients and bring about improved bodily health. An army hut is equipped as a workshop, and provides means for training in woodwork, boot repairing, and hurdle making. The patients also have facilities for recreation. An X-ray apparatus is installed.

An agreement exists between the County Council and the Barrow-in-Furness Corporation for the reservation at High Carley of a number of beds, not exceeding 16, for Borough patients. These beds when not required are filled by County patients, in accordance with arrangements with the Corporation.

Dr. Pask reports as follows on matters relating to the treatment of the patients and the administration of the sanatorium :—

Patients on admission are put to rest in bed, and in the great majority of cases are allowed up after four or five days. Those with a high temperature are kept in bed until it subsides. Frequently, however, the pulse rate does not tend to subside as quickly as the temperature, and in a certain proportion of



cases it remains high in spite of rest in bed. Provided the patients are doing well in every other way, I allow them to get up after about five weeks in bed and there has been no ill effects, I think the fact of permitting them up for a short time helps their general condition.

The dietary prescribed is on a liberal scale. Two pints of milk per day were allowed for each patient. Specimens of milk are taken regularly and submitted to the Public Health Laboratory, Manchester, for bacteriological examination. As regards the ordinary articles of diet, I have worked out the daily consumption per patient, and the figures are as follows :—

Ham and bacon	2·53 ozs.	Cheese	...	0·22 ozs.	Flour	...	5·62 ozs.		
Oatmeal	...	0·93 ozs.	Potatoes	...	1·01 lbs.	Butter	...	0·87 ozs.	
Eggs	...	...	0·48 eggs	Meat	...	6·13 ozs.	Sugar	...	2·22 ozs.

The total cost per patient per week at High Carley Sanatorium works out at 35s. 4·7d., exclusive of rates and loan charges. A memorandum, issued by the Ministry of Health, showing the cost per week at residential institutions for the treatment of tuberculosis, indicates that of 140 institutions for adult patients High Carley is the seventeenth cheapest institution to maintain. As regards the economical cost of the sanatorium I should like to acknowledge the efficient management of the matron, Miss Woosey, to whose efforts in a large measure this is due.

The work done by patients who are physically fit has been very beneficial as a means of improving their condition, which is of course the main object ; also, incidentally quite a lot of useful work has been accomplished. In the joinery workshop (which is an old Army hut) the following has been done :—Construction of sections of a large shed (for use at the sanatorium), making cupboards, shelving, etc., together with numerous repairs to plant and furniture. There is no question that without this help it would be necessary to employ a permanent joiner at an institution of the size of High Carley.

In the shoemakers' shop, where two male patients are employed, boots and shoes of the patients and staff at High Carley and Oubas House are repaired ; the number of repairs done during 1927 was 121.

The making of wattle hurdles has been continued.

The poultry farm has had a very successful year and a profit of £83 18s. 5d. has been made. There were 240 chickens reared, and 18,346 eggs laid. This section is completely run by

four women patients, and, I think, shows a very satisfactory state of affairs, as patients on admission do not possess any previous knowledge of poultry keeping.

No important change has taken place as regards the grounds beyond the transplanting of numerous pine trees from the nursery to other sites.

The institution is practically self-supporting as far as garden produce is concerned ; this is a considerable asset as it ensures a supply of fresh vegetables. A feature of the 1927 crop was the quantity of green peas grown ;  $19\frac{1}{2}$  cwts. were gathered.

Artificial pneumothorax treatment has been continued. In 12 cases this form of treatment was attempted, but in three it was found impossible to find a suitable site for injection owing to pleural adhesions. Of the remaining nine cases, six showed signs of definite improvement and the treatment was undoubtedly justified. Three did not improve and the treatment was discontinued. It should be stated that in the three cases in question there was a considerable amount of disease on both sides, and as the patients showed no improvement artificial pneumothorax treatment was tried as a last resort on the side chiefly affected. In one case the patient's life was certainly prolonged for some considerable time as a result.

Mr. Miller continues to attend weekly for a dental session, providing artificial dentures where necessary, the cost of which is borne by the County Council, except in cases of certain insured persons where their approved society makes a grant towards the cost. The number of patients who received dental treatment during the year was 187.

The X-ray apparatus (gas tube type), continues to function satisfactorily, and is extremely useful. The skiagrams taken numbered 126, and the screenings 124.

The weight was recorded of patients who were discharged after completing two or more months treatment. The figures are as follows :—

128 males—average gain in weight 11 lbs.  $9\frac{1}{2}$  ozs.

101 females—average gain in weight 11 lbs. 10 ozs.

Below are given for the last four years the percentages of patients who were admitted with a positive sputum and discharged with a negative or no sputum :—

1924, 21·32% ; 1925, 12·82% ; 1926, 16·98% ; 1927, 20·56%.



During the year 1,468 specimens of sputum were examined for tubercle bacilli with the following results :—Positive 759, negative 709.

Careful attention is given to the recreation of the patients. The Marconiphone four-valve wireless set, which has been in use four years, still continues to give satisfactory service, and is much appreciated by the patients especially during rest time.

Billiards is a popular form of amusement for the men patients throughout the year. In the summer time various other forms of recreation are provided, such as bowls, croquet and clock golf.

We are indebted to the numerous local organizations in Barrow, Dalton, and Ulverston who have visited the sanatorium with concert parties.

The sanatorium library now consists of over 900 volumes, and the issuing of books is made by a patient appointed from the men's and women's sections respectively. Loans of books to patients during the year numbered 6,000. The library is replenished from time to time by grants from the County Council, and by gifts of books from the British Red Cross Society. It is hoped to establish a reference library next year, when technical books will be kept and these will be issued, when required, to patients in other County sanatoria and pulmonary hospitals.

Nurses Lupton and Hill were granted certificates after two years training as probationers and passing satisfactorily examinations in nursing, elementary physiology and anatomy. It would be an advantage if this training could be recognized so as to shorten the time of training at a general hospital for those nurses wishing to take up general nursing afterwards.

Sir George Newman, Chief Medical Officer of the Ministry of Health, visited the sanatorium on the 27th November, 1927, and he made a detailed inspection of the institution, accompanied by our Chairman, Colonel C. J. Trimble, C.B., and Dr. Cox. The stimulating influence of such a visit undoubtedly tends towards the better working of the institution.

The following table shows the condition of patients discharged during the year 1927 :—

TABLE 19.

Classification on admission to the Institution.	Condition at time of discharge.	Duration of Residential Treatment in the Institution.				Total.	
		Under 3 months.	3—6 months.	6—12 months.	More than 12 months.	No.	%
T.B. Minus.	Quiescent ... ..	32	25	6	2	65	68·4
	Improved ... ..	10	3	3	—	16	16·8
	No material improvement ...	9	2	1	—	12	12·6
	Died in Sanatorium ... ..	—	2	—	—	2	2·1
T.B. Plus 1.	Quiescent ... ..	4	4	2	1	11	18·3
	Improved ... ..	13	11	9	4	37	61·7
	No material improvement ...	3	5	1	2	11	18·3
	Died in Sanatorium ... ..	—	—	1	—	1	1·7
T.B. Plus 2.	Quiescent ... ..	2	3	3	—	8	10·0
	Improved ... ..	11	17	15	5	48	60·0
	No material improvement ...	12	6	4	2	24	30·0
	Died in Sanatorium ... ..	—	—	—	—	—	—
T.B. Plus 3.	Quiescent ... ..	—	—	—	—	—	—
	Improved ... ..	2	—	1	—	3	75·0
	No material improvement ...	—	—	—	—	—	—
	Died in Sanatorium ... ..	1	—	—	—	1	25·0
		Under 1 week.	1—2 weeks.	2—4 weeks.	More than 4 weeks.		
Observation for purpose of diagnosis.	Tuberculous (pulmonary) ...	—	—	3	13	16	40·0
	Non-tuberculous ... ..	—	—	5	18	23	57·5
	Doubtful ... ..	—	—	1	—	1	2·5
Total ...						279	

(2) OUBAS HOUSE CHILDREN'S SANATORIUM, ULVERSTON.

*Medical Superintendent :* Dr. E. H. Allon Pask.

*Assistant Medical Superintendent :* Dr. H. J. Villiers.

*Matron :* Miss E. Woosey. *Sister-in-Charge :* Miss D. Pope.

In May, 1920, the County Council took Oubas House on an assignment, for the residue of a term of 21 years dating from November, 1912, and in March, 1928, decided to purchase the property for the sum of £1,500.



The house stands in its own grounds (about one acre in extent), and accommodates 21 girls. A portion of an army hut has been adapted for use as a classroom. Educational instruction is given to the children in conformity with the requirements of the Board of Education.

This sanatorium is administered in conjunction with the High Carley Sanatorium, the nursing staff at Oubas House consisting of a sister-in-charge, two probationer nurses (one of whom acts as night-nurse), and also one certificated teacher.

During the year 50 patients were discharged and one died.

Dr. Pask reports as follows :—

The response to treatment by the patients (girls from 3 to 15 years of age) has been very satisfactory. Treatment has consisted of the usual sanatorium regime (fresh air, nourishing food, rest, graduated exercise and school work). Owing to the inclement weather heliotherapy (natural sunlight) was not carried out to the same extent as in previous years, but full use was made of this form of treatment in selected cases, when it was available, with beneficial results.

During the year “grade A” milk was substituted for ordinary milk as it was felt to be most important when treating children that the milk supply should be of the best quality. It is a well-known fact that much tuberculous infection in children comes from infected milk.

A trial was given to “Ostelin,” which is claimed to be a preparation of the active medicinal portion of cod liver oil separated from its fatty constituents and representing vitamin D in high concentration. Four cases were given this preparation and details are given in another part of the report (see chapter VI on new methods of treatment).

In the school a special feature is made of handicraft, and exhibitions of the children’s work, including wicker trays, raffia baskets, work bags, etc., have been sent to the “health weeks” which have been held in various parts of the County. The specimens of work were much admired. The school is under the charge of Miss Gibson, who is a certified teacher, as well as a trained nurse, and I consider that we are very fortunate in having her as she takes a kindly and intelligent interest in each individual child. I should like to acknowledge with thanks her efforts, and those of the nursing staff, which largely contribute to the atmosphere of cheerfulness pervading the institution.

Our best thanks are due to numerous friends who have been kind enough to present toys and articles for the amusement of the patients, and also for the large quantity of good things provided at Christmastide, all of which were thoroughly appreciated by the patients.

Lady Fell (and during her absence abroad, Mrs. Heywood) and Mrs. Hutchinson have paid periodical visits of inspection which are very helpful.

During the year 50 specimens of sputum were examined—all negative.

### (3) ELSWICK SANATORIUM, NEAR KIRKHAM.

#### *Medical Superintendent :*

George Leggat, M.B., Ch.B., D.P.H. (Aberdeen).

*Matron :* Miss I. G. Barclay.

This sanatorium is situated on the east side of Elswick village, and is about six miles from Kirkham station. The buildings and about 11 acres of land belong to the Fylde, Preston, and Garstang Joint Smallpox Hospital Board, and were taken on lease by the Lancashire County Council in 1913 for a period of 21 years. The Council are under an obligation to vacate the premises in case of a severe epidemic of smallpox. The accommodation was originally used entirely for 57 pulmonary cases, but in February, 1925, the male pavilion was adapted for 24 non-pulmonary cases. The accommodation now provided is : Pulmonary cases, 16 males and 25 females ; non-pulmonary cases, 12 males and 12 females ; total 65. An X-ray apparatus is provided in a separate building erected in 1925.

During the year, 66 County patients received some form of dental treatment from the visiting dental surgeon (Mr. J. J. Ward).

Dr. Leggat reports as follows on matters relating to the treatment of patients and the administration of the sanatorium :—

During the last 12 months the acute pulmonary cases have been fixed in spinal jackets, strapped down to the beds, as in the treatment for spinal caries. This method was adopted as it was found that in the treatment of “ combined ” cases of spine and chest the condition of the chest improved. It certainly ensures less movement on the patient’s part, and to a certain extent limits the movement of the chest. The patients so treated feel the improvement, and do not appear to object to being strapped down.

In cases where there have been mixed infections, good results have been obtained with the use of catarrhal vaccines. Applications of collosol calcium are also being tried, but though



with pulmonary cases the results so far have been somewhat disappointing, it would appear as if certain types of surgical cases were showing distinct improvement.

Artificial sunlight treatment has been a leading feature of the year's work on the surgical side, with excellent results in cases of broken-down glands, lupus, and sinuses of the more superficial joints, though with types of deeper sinuses of the hips and spines marked response has not been evident.

The number of minor operations, such as aspirations of abscesses, carried out has been just over 100.

The average length of stay of patients in the sanatorium has been :—Pulmonary 7·7 months, non-pulmonary 10 months. During the year there were 93 admissions, 82 discharges, and 6 deaths—three on each side : those on the pulmonary side were advanced cases on admission, whilst those on the surgical side were of old-standing cases having had discharging sinuses of many years duration.

All sputum examinations have been carried out in the institution laboratory. The total done during the 12 months was 258, of which 150 were positive. Ten cases having a positive sputum on admission were recorded negative or had none at all on discharge, and the bacillary loss shown was 14·7 per cent.

The X-ray apparatus again has proved to be of great value in the helping of diagnosis and in the control of treatment of both pulmonary and surgical cases. The number of skiagrams taken of sanatorium patients during the year was 124, and 17 screen examinations were made.

The number of splints and special surgical appliances supplied to patients prior to discharge was eleven.

A big effort was made to till more land and with success, with the result that there is now an area of five acres under cultivation. Improvements also have been made in creating fresh lawns and herbaceous borders in front of the female pavilion.

The upkeep of the poultry last year has been entirely under the charge of patients, and proved a useful and congenial occupation. The total number of eggs taken for sanatorium use was 26,806.

The discipline for the year has been very good indeed, and I am glad to be able to report again that patients appear to realize more fully the importance of prolonged treatment, and are much more willing to settle down.

The following table gives the condition of patients discharged during 1927 :—

TABLE 20.

Classification on admission to the Institution.	Condition at time of discharge.	Duration of Residential Treatment in the Institution.				Total.	
		Under 3 months.	3—6 months.	6—12 months.	More than 12 months.	No.	%
T.B. Minus.	(a) Pulmonary.						
	Quiescent ... ..	2	7	11	2	22	70·9
	Improved ... ..	2	1	1	—	4	12·9
	No material improvement ...	4	—	—	—	4	12·9
	Died in Sanatorium ... ..	—	1	—	—	1	3·2
T.B. Plus 1.	Quiescent ... ..	—	1	—	2	3	21·4
	Improved ... ..	3	2	3	2	10	71·4
	No material improvement ...	1	—	—	—	1	7·1
	Died in Sanatorium ... ..	—	—	—	—	—	—
T.B. Plus 2.	Quiescent ... ..	2	1	2	—	5	27·8
	Improved ... ..	1	1	3	1	6	33·3
	No material improvement ...	1	3	2	—	6	33·3
	Died in Sanatorium ... ..	—	—	1	—	1	5·5
T.B. Plus 3.	Quiescent ... ..	—	—	—	—	—	—
	Improved ... ..	1	—	—	—	1	50·0
	No material improvement ...	—	—	—	—	—	—
	Died in Sanatorium ... ..	—	1	—	—	1	50·0
Bones and Joints	(b) Non-Pulmonary						
	Quiescent ... ..	2	4	2	3	11	68·7
	Improved ... ..	—	1	1	—	2	12·5
	No material improvement ...	—	—	—	—	—	—
	Died in Sanatorium ... ..	—	—	1	2	3	18·7
Abdominal	Quiescent .. ..	—	1	—	—	1	50·0
	Improved .. ..	—	—	—	1	1	50·0
	No material improvement ..	—	—	—	—	—	—
	Died in Sanatorium .. ..	—	—	—	—	—	—
Other Organs	Quiescent .. ..	—	—	1	—	1	100
	Improved .. ..	—	—	—	—	—	—
	No material improvement ..	—	—	—	—	—	—
	Died in Sanatorium .. ..	—	—	—	—	—	—
Peripheral Glands	Quiescent .. ..	—	—	1	1	2	100
	Improved .. ..	—	—	—	—	—	—
	No material improvement ..	—	—	—	—	—	—
	Died in Sanatorium .. ..	—	—	—	—	—	—
Observation for purpose of diagnosis.	(c) Observation Cases	Under 1 week.	1—2 weeks.	2—4 weeks.	More than 4 weeks.		
	Tuberculous (non-pulmonary) ..	—	—	—	1	1	50·0
	Non-tuberculous .. ..	—	—	—	1	1	50·0
	Doubtful .. ..	—	—	—	—	—	—
Total ..						88	



## (4) CHADDERTON PULMONARY HOSPITAL.

*Visiting Medical Superintendent :*

James Wood, M.D., M.B., Ch.B., D.P.H., R.C.P.S.I.

*Matron :* Miss E. Simmons.

An agreement was made on the 1st October, 1919, with the Chadderton, Royton, and Crompton Joint Hospital Board for the use of the buildings, erected as a smallpox hospital, for the treatment of patients suffering from pulmonary tuberculosis. Accommodation is now provided for 40 female patients whilst five additional beds were provided early in 1928. The County Council are under an obligation to vacate the premises in case of an epidemic of smallpox.

Dr. Wood reports as follows :—

All the cases admitted are females. Ninety-four patients were admitted and ninety-seven were discharged (including 31 deaths). One case was admitted for observation. The average stay in the hospital was 136 days.

Twenty-five of the cases admitted were under 20 years of age.

Most of the patients were advanced cases and some of the very worst—who only survived a short time—were admitted because they had no nursing facilities in their own homes.

The treatment as carried out in previous years has been continued, namely, rest in bed, good and varied nourishing food, and fresh air. Practically all cases are kept in bed until the temperature becomes normal and remains so for a considerable time. At the same time I like the pulse rate to drop to normal before I feel that they will obtain benefit by getting out of bed. The length of time the patients are allowed out of bed is gradually increased if the temperature or pulse is not adversely affected. Very few chafe at these conditions after the reason for the enforced rest is explained to them.

Many of our patients remain for lengthy periods, and during the year several of them have improved considerably and have been transferred to sanatoria for further treatment.

There are two well-stocked libraries—one for the patients, containing 399 books ; and one for the staff, containing 176 books. Good use has been made of the opportunities provided for reading.

A few entertainments have been given by people from the surrounding districts. The wireless set and gramophone continue to provide amusement for the patients and staff, and, when the weather permitted, clock-golf was played by those patients who were fit for the gentle exercise.

Christmas was a very pleasant time. The wards were neatly decorated, most of the work being done by the patients, and an entertainment was given by the patients and staff.

On the whole, the patients and the staff have been very content, and complaints of any description few.

During the year 89 specimens of sputum were examined, 28 of which were positive and 61 negative.

(5) HEATH CHARNOCK PULMONARY HOSPITAL, NEAR CHORLEY.

*Medical Superintendent :*

J. W. Rigby, L.R.C.P. (Lond.), M.R.C.S. (Eng.).

*Matron :* Miss H. Sinclair.

By agreement with the Chorley Joint Hospital Board, the County Council erected, equipped, and furnished two pavilions, containing 16 and 14 beds respectively, together with a dining-hall and some staff accommodation. The pavilions were opened in November, 1914. In 1921, a hut was erected as a recreation-room for male patients. The Joint Board are responsible for the administration of the hospital, the County Council paying to them the cost of maintenance.

Dr. Rigby has kindly furnished the following report :—

The year 1927 was unfortunately not a good one from a health point of view : we had more than our share of wet days, which had an adverse effect upon the minds and bodies of many of our patients. Still, on the whole, the conduct of the patients has been satisfactory, and the progress made has been fair. Great credit must be given to the staff for this, as we have few forms of recreation, and it is a hard task to keep the advanced cases we get in a cheerful frame of mind. I do think, however, much more might be done to help us. The lawns (of limited area) are much too rough to be satisfactorily used for croquet—the only game in which the patients take any active part—whilst the staff are without any lawn tennis court.



Great care has been bestowed on the garden, which looks well, and is much appreciated by the patients. Little more can be said about the hospital—the work has gone on with smoothness and every endeavour has been made to make the inmates happy during their stay, and I venture to think the result has been good. One great improvement has been made at the infectious diseases hospital during the year, a laboratory having been built and equipped. The result has been a great increase in the number of sputums examined, and a great help to the treatment at the pulmonary hospital.

(6) PEEL HALL PULMONARY HOSPITAL, LITTLE HULTON.

*Visiting Medical Superintendent :*

G. Jessel, M.A., M.D. (Oxon.), D.P.H. (Manchester).

*Matron :* Miss A. Jones.

The Hall, with about 17 acres of land attached thereto, was presented in 1914 to the Lancashire County Council by Mr. A. Wynne-Corrie, and an additional 20 acres of land has been purchased. The adaptation of the premises as a pulmonary hospital for the treatment of advanced and chronic cases suffering from tuberculosis—delayed owing to the Great War—was completed in 1921. The County Council in May, 1927, acquired an additional 8 acres of land on the north side of the estate to remove the possibility of dwelling-houses being erected in too close proximity to the hospital.

The accommodation has been increased from 46 to 52, all adult males, by the provision of sleeping shelters. The hospital serves principally Dispensary Area No. 4 in taking advanced, observation, and educational cases.

A motor ambulance is provided and is available also for conveying patients from their homes to other hospitals.

Dr. Jessel reports as follows on the year's work at the hospital :—

The number of admissions was 110 including 2 observation cases, and as usual the patients were mostly of two types (1) acute, febrile and progressive, (2) chronic cases with fair resistance. As the result of symptomatic treatment, together with absolute rest in bed on the balcony or near open windows, suitable dietary and careful nursing, many cases lost their fever and joined the second group. Gradually getting up, they were able to take an increasing amount of exercise, and regained much of their former strength and weight. The young adults however, have not usually done so well as the middle-aged and elderly men. A large proportion of the patients put on weight

and improved considerably in health, and although most on discharge were unfit to do a full day's work, some few became fit for and resumed work. The average length of stay of all patients, excluding observation cases, was 156 days, as compared with 142 days in 1926 and 117 days in 1925. It was to be expected that a number of the cases would run an unfavourable course, and owing to unsatisfactory home circumstances 38 patients terminated their illness in hospital. The average length of stay of these patients was 137 days, as compared with 105 and 130 days in 1926 and 1925 respectively. The hospital is thus fulfilling its function of endeavouring to prevent the spread of an infectious disease, quite apart from the treatment and nursing that it affords.

It will have been gathered that the patients must have been happy and comfortable to remain voluntarily for as long an average period as 156 days, the more especially as most of them had been unwell for some time prior to admission. As a matter of fact, the cheerful atmosphere that prevails throughout the hospital evokes the surprise of many visitors. Many factors, however, have designedly contributed to this end. Since the opening of the hospital in 1921, persistent efforts have been made to improve the buildings and grounds. The castle-like appearance of the exterior, and the interior arrangements of the hospital are quite unlike the stereotyped sanatorium or hospital block. The eight dormitories or wards of varying size with their loud wireless speakers, and the dining-room with its separate tables, its pictures, and flowers, all looking out upon gardens or fields, are bright and attractive. There are also two recreation rooms with billiard table, piano, gramophones, a library of over 600 volumes, bowling green, putting green, etc. These features can scarcely fail to exercise some beneficial effect upon the mentality of the patients.

Such amenities, however, would be unavailing were it not for the pleasant, cheerful atmosphere that prevails generally amongst the patients themselves. They learn by degrees the peace of mind that comes from unselfish comradeship with a common aim in view, and become eager to uphold the good reputation of their temporary home. The main source of this attitude of courage and cheer is undoubtedly the steady application of the system of "hobby-occupations," whereby every patient, according to his state of health, exercises mind and body in some form interesting to himself and helpful to other patients or the hospital. In this way is applied the basis of all good family life. The graded hobby-occupations include



various activities in the gardens, greenhouses, wood-shed, engineer's shop, garage, carpenter's shop, poultry run, window cleaning, and the office of librarian, gramophone steward, etc. These occupations engage the attention of from two to three-fifths of the patients at any one time. The remainder read, draw, listen to the wireless, etc., or are content to watch the ever-changing picture of busy active life around them.

Last year as usual various whist-drives and competitions were held, and welcome visits received from concert parties, including one at Christmas composed of the nursing staff. A special feature was again made of the Christmas festivities, preparations for which engaged the attention of the patients for the previous two months. Each ward was decorated to represent some definite idea, *e.g.* an orange-grove, rose-garden, frosty morning, blue-bird, Jazzland, etc., and the results were delightfully effective. The second issue of the hospital Christmas magazine entitled *Our Mag*, containing matter written by the patients, was a great success, and over 200 copies duplicated at the office of the dispensary area found a ready sale.

The nurses as usual attended my weekly class during the winter months. In the summer the hospital lost the services of the sister, Miss Simmons, on her appointment as matron of the Chadderton Hospital, she being the second of our Peel Hall sisters to receive promotion as matron of one of the County tuberculosis institutions. We were, however, fortunate in her successor, Miss Pegg. The matron (Miss Jones) and the whole of the nursing staff have as usual been unremitting in their attention to the patients, who for their part have not been lacking in their appreciation of the efforts made on their behalf.

#### (7) RUFFORD PULMONARY HOSPITAL.

##### *Visiting Medical Superintendent :*

C. W. Laird, B.A., M.D. (Dublin), D.P.H. (Liverpool).

*Matron :* Miss E. Moseley.

The County Council acquired, on the 18th October, 1920, Rufford New Hall, situated on the west side of the main road from Preston to Ormskirk, together with 128 acres of land adjoining the Hall. Under pressure from the Ministry of Health, a scheme was prepared for using the Hall and land for discharged sailors and soldiers, and the scheme included training the patients in several occupations. Some additional

land was also obtained with a view to training in agricultural work but all this, however, was abandoned by order of the Ministry of Health, owing to the financial stringency.

The premises were first used as a pulmonary hospital on the 7th April, 1926.

The hospital serves as far as possible the districts in West Lancashire, so that relatives and friends will have reasonable facilities for visiting.

A motor ambulance has been provided, available for the hospital and also for conveying County patients to other hospitals—often involving journeys of 100 miles.

Dr. Laird reports as follows on matters relating to the treatment of patients and the administration of the hospital :—

There has not been wanting during the year indication that the institution has proved suitable for the type of case with which it is mainly concerned. Those with pulmonary tuberculosis of a pronounced degree have, in a great majority of instances, derived considerable benefit from their stay ; and it is significant that many have expressed a desire to return for further treatment, while others have been content to remain for long periods, recognizing the favourable progress which they have made.

It may not, and doubtless is not, peculiar to this hospital that some patients have expressed a particular wish for admission to its wards, and that others have made it a stipulation of their leaving home that they should not be sent elsewhere ; but it is at least complimentary and suggestive of the fact that the reputation of the place has not suffered at the hands of those who have experienced what it has to offer. Certainly, as far as one can discover, there is little left undone by the matron and the nursing staff to brighten the lives of those unfortunate sufferers who come to claim their care. Such comforts as can be given are freely bestowed. Their thoughts are taken as much as possible from their ailments by recreations, suitable light occupation, and entertainment of various kinds. Those patients who have to spend most or all of each day in bed, have their attention diverted and their interest aroused in fashioning from raffia a number of articles such as mats, satchels, purses, hats and blotting pad covers. Some engage in the plaiting of cane to form wicker flower-pots, trays, and other things. Others spend their time in making nets, or apply themselves to crochet work, embroidery, drawn-thread work, hem-stitching and several forms of needlecraft. For the more robust, light tasks are found according to their condition.



Whist parties, sketches, and similar diversions are arranged from time to time, while a piano, a gramophone, and a wireless set contribute to the general scheme of entertainment.

Books from a patients' library are available, and newspapers and periodicals are also supplied. The grant made by the County Council towards the library and gifts from the British Red Cross Society in providing such literature are gratefully acknowledged.

Amongst outdoor games, croquet, clock-golf, and bowls find a place.

The clergy are attentive to the spiritual needs of their respective denominations.

As regards the actual treatment of patients, long rest is enforced while the disease is unduly active, but it is recognized that even this important measure can be overdone and modification is often called for. Fresh air in plenty and plain nourishing food supplement it, and constitute with it the main feature of the general routine.

In several suitable cases artificial pneumothorax treatment has been given as a special measure, and, in nearly all of these, has been attended by striking improvement, with a promise, in some, of ultimate arrest of the disease. So encouraging have been the results that one regrets the limitations of this form of therapy. One most serious limitation is the very considerable demand on one's time which this treatment entails.

The X-ray plant has been put to much greater use during the year, the number of radiological examinations being approximately 256, of which some 33 were cases from outside the hospital.

The theatre has also been utilized more frequently for therapeutical collapse of the lung, and for aspirations and similar measures.

Of sputum examinations the total was 264 of which 163 were positive and 101 negative.

There were 122 cases admitted during the year ; 102 cases were discharged, and 18 died.

## (8) WITHNELL PULMONARY HOSPITAL, NEAR CHORLEY.

*Visiting Medical Superintendent :*

B. MacPhee, M.B., Ch.B. (Glas.), D.P.H. (Camb.).

*Matron :* Miss D. Willman.

The County Council in December, 1924, purchased Withnell Hall (including two cottages, outbuildings, and 37 acres of land) situated on the main road from Blackburn to Chorley, in order to replace the Bull Hill Pulmonary Hospital, Darwen, which at the instance of the Ministry of Health ceased to be used for the treatment of tuberculosis. The work of adapting the Hall and the provision of a new block for patients was completed in August, 1927, the first patient being admitted on 15th August. Accommodation is provided for 50 male patients (28 in cubicles, 18 in wards and 4 in shelters). The hospital serves mainly dispensary area 2 (East Lancashire).

There are also provided on the estate three houses for employees—two semi-detached new houses and one house converted from two cottages included in the purchase.

By arrangement with the Withnell Urban District Council the sewage from the hospital is turned into the public sewer.

Dr. MacPhee reports as follows :—

From the 15th August, 1927, to the end of the year 82 patients were admitted and 29 discharged, whilst 13 died.

A special feature of this institution is the cubicle system which has been adopted. The hospital block contains an upper and a lower storey, the lower storey containing four single-bed cubicles and five double-bed cubicles, with a ward for five beds ; and the upper storey four single-bed cubicles and five double-bed cubicles, with three wards for four, five, and five beds respectively ; so that whilst the hospital is primarily intended for advanced cases, it is enabled to accommodate “ doubtful ” cases sent in for observation and treatment.

Since the opening of the hospital, four wooden shelters have been erected to accommodate cases that are comparatively well.

A very efficient X-ray apparatus was installed and has been found of great service in determining the extent of disease in individuals, and also in arriving at an early definite opinion regarding the diagnosis in doubtful cases.



I am glad to be able to report that a good start has been made in organizing a joiner's shop under an instructor patient for those cases that are able to take up the work of joinering. Several of the patients are also engaged in cobbling, but for the greater part patients are given light work such as sweeping the paths and verandahs, polishing brasses, etc.

The amusement of the patients is also catered for in that they have a well-furnished reading room and library, a billiard room with a three-quarter size table, and a piano. It is hoped soon to be able to have installed a wireless apparatus as most of the money for the fund, originated by the matron, has been collected.

#### (9) WRIGHTINGTON HALL, PARBOLD.

The County Council, in November, 1921, purchased Wrightington Hall, outbuildings and estate of 159 acres, with a view to utilising it eventually for the provision of accommodation for children.

The Hall is situated on the high road between Standish and Parbold, about six miles north-west of Wigan, and stands at an altitude of 300 feet above sea level.

Plans were prepared in 1921 for the adaptation of the buildings, but under instructions from the Ministry of Health no work was commenced, and the scheme remained in abeyance until early in 1926, when the County Council approved generally of proposals to adapt the Hall and erect buildings to accommodate 226 patients—80 beds for adults and 146 for children. The Ministry of Health in May, 1927, agreed to the proposals of the Council, and plans satisfactory to the Ministry have been completed, receiving the approval of the Council in August, 1927. The Ministry have intimated that they are prepared to recommend a Government grant of £180 per bed towards the capital expenditure, which is estimated to be £147,951. Quantities and specifications are now being prepared by the County Architect and tenders will shortly be invited.

A description of the site and the proposed buildings was given in the report for 1926.

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## XIII.—DENTAL TREATMENT.

Patients eligible for dental treatment are those who, in the opinion of the medical superintendent or tuberculosis officer, are unable to derive full benefit from their treatment for tuberculosis owing to defective teeth. Patients already covered by dental schemes of other bodies are excluded from benefit.

The following statement shows the dental work carried out during 1927, under the scheme approved by the County Council :—

TABLE 21.

	At County Council Sanatoria.		At other Sanatoria and Hospitals.	At Patients' Homes.	Total.
	High Carley	Elswick			
Total No. of individual patients who received dental attention (any form) ... ..	187	66	75	34	362
New Dentures provided—					
(a) Complete sets ... ..	30	6	24	22	82
(b) Partial sets ... ..	19	7	25	11	62
Repairs to Dentures ... ..	14	4	6	1	25
No. of Extractions ... ..	338	254	499	354	1,445
No. of Fillings ... ..	62	7	5	7	81
No. of Scalings and Cleanings ... ..	2,516	195	12	2	2,725
No. of other Operations ... ..	399	37	—	—	436

The dental scheme, considering the benefit derived by the patients, has proved economical, and is fully justified.



## XIV.—SANATORIUM TREATMENT.

## IMMEDIATE RESULTS.

Under the County scheme, patients are not limited to any definite period for sanatorium treatment—the length of stay depending on the recommendation of the medical superintendent. Cases likely to become quiescent have always received as long a period of treatment as considered necessary on medical grounds. *Excluding patients leaving prematurely for other than medical reasons the average duration was nearly 5½ months.*

The following Table 22, summarising the *immediate* results of sanatorium treatment of patients discharged in 1927, has been prepared from the information as to the condition of patients given by medical superintendents in their discharge reports:—

Classification on Admission to the Institution.*	Condition at time of discharge.	Duration of Residential Treatment in the Sanatorium.												Total Patients Dis- charged.	
		Under 3 months.			3—6 months.			6—12 months			More than 12 months.				
		M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	No.	%
T.B.  Minus.	Quiescent ... ..	27	24	7	26	37	20	11	10	5	3	1	2	173	52·2
	Improved ... ..	16	11	5	16	10	16	12	3	19	—	1	8	117	35·3
	No material improvement	8	13	1	1	2	1	1	1	1	—	—	—	29	8·8
	Died in Sanatorium ...	2	1	2	3	2	1	—	—	—	1	—	—	12	3·6
T.B. Plus 1 (Early)	Quiescent ... ..	4	3	1	3	5	—	2	4	—	1	3	—	26	18·9
	Improved ... ..	15	4	—	27	8	—	16	5	—	4	3	3	85	62·0
	No material improvement	6	2	—	5	2	1	3	1	—	1	2	1	24	17·5
	Died in Sanatorium ...	1	—	—	—	—	—	—	1	—	—	—	—	2	1·4
T.B. Plus 2 (Inter- mediate)	Quiescent ... ..	4	2	—	6	1	2	5	5	1	—	1	—	27	10·3
	Improved ... ..	30	9	1	34	20	—	25	22	—	2	9	—	152	58·2
	No material improvement	11	16	1	13	9	—	10	4	—	2	1	1	68	26·0
	Died in Sanatorium ...	2	4	—	7	—	—	—	1	—	—	—	—	14	5·4
T.B. Plus 3 (Ad- vanced)	Quiescent ... ..	—	—	—	—	—	—	—	1	—	—	—	—	1	3·0
	Improved ... ..	1	3	—	3	1	—	2	1	—	—	—	—	11	33·3
	No material improvement	2	2	—	5	1	1	1	2	—	—	—	—	14	42·4
	Died in Sanatorium ...	2	—	—	2	1	—	—	1	—	—	1	—	7	21·2
	Total ... ..	131	94	18	151	99	42	88	62	26	14	22	15	762	—
Observa- tion for purpose of Diagnosis.		Under 1 week.			1—2 weeks.			2—4 weeks.			More than 4 weeks				
	Tuberculous ... ..	—	—	—	—	—	—	—	3	1	7	6	3	20	40·0
	Non-tuberculous ... ..	—	—	—	—	—	—	3	2	—	6	12	5	28	56·0
	Doubtful ... ..	—	—	—	—	—	—	1	—	—	—	—	1	2	4·0
GRAND TOTAL ... ..														812	

\* Classification in accordance with Memorandum 37/T of the Ministry of Health.

These cases are distinct from those who received treatment in a pulmonary hospital or observation hospital. Such treatment is granted almost solely for purposes of education or isolation, and no useful purpose is attained in trying to show curative results.

## XV.—TREATMENT IN PULMONARY HOSPITALS.

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The treatment of advanced and infectious cases at pulmonary hospitals is one of the best measures for preventing the spread of infection. The County scheme provides for the treatment, on the recommendation of the tuberculosis officers, of patients in appropriate institutions: (a) in sanatoria for early and intermediate cases; and (b) in pulmonary hospitals near to the patients' homes for advanced cases of consumption unable to be isolated or treated properly at home.

In the pulmonary hospitals, also, patients are admitted for the purpose of isolation, occasionally for observation in regard to diagnosis, and particularly for education in general methods of hygiene which, when the patients return home, can be applied in suitable cases, much more effectively after a short period of institutional treatment.

In three of the five dispensary areas, one of these pulmonary hospitals is in charge of the consultant tuberculosis officer, a very useful arrangement because patients come to these hospitals from the area administered by the tuberculosis officer, who is, therefore, conversant with the home conditions. Further, it is of great advantage to the tuberculosis officer, because it provides the means of applying certain forms of treatment and of carrying out valuable clinical and research work.

Often patients from each of the five dispensary areas requiring isolation are accommodated in the pulmonary hospitals (not administered by the County Council) situated in or near the area. In order that the consultant tuberculosis officers may keep themselves acquainted with the cases, arrangements have been made (with one or two exceptions, where only occasional County cases are treated) for the tuberculosis officers to visit periodically the pulmonary hospitals in their area and confer with the medical superintendents on the following matters:—(1) The question of extension of patients' treatment or their return home, having special regard to the home conditions which are known to the tuberculosis officer; (2) the question as to patients' future treatment; (3) applications from patients for transfer to other institutions, or for their discharge home, and to settle, where possible, any difficulties or complaints by patients which may arise.

The foregoing working arrangements have enabled the highly infectious cases with unsatisfactory home conditions to remain at the pulmonary hospitals for long periods for the purpose of isolation, and



for patients who have made good progress and are capable of light work to be transferred to sanatoria for the continuation of their treatment.

By the Public Health Act of 1925, a County Council now has power to secure the compulsory isolation of infectious cases on the order of the magistrates, but so far it has not been necessary to exercise that power.

Brief particulars are given in the following Table 23 of the 17 pulmonary hospitals available for the treatment of County patients :—

TABLE 23.

Name of Hospital.	Number of Beds Reserved.	1927 : Number of Patients—		
		Admitted.	Discharged.	Died.
*Bull Hill, Darwen ... ..	21	29	26	13
Burnley ... ..	10	31	22	7
Chadderton, near Oldham ... ..	39	94	66	31
East Lancashire, Cheshire ... ..	50	18	12	1
Eccleston Hall, near St. Helens ... ..	5	15	8	6
Heath Charnock, near Chorley ... ..	30	64	45	19
Hefferston Grange, Cheshire ... ..	12	11	12	3
Linacre, Bootle ... ..	1	—	1	—
†Luncside, Lancaster ... ..	21	57	38	23
Marland, Rochdale ... ..	5	10	8	3
Mount Pleasant, Liverpool ... ..	1	1	—	1
Peel Hall, Little Hulton ... ..	46	110	79	38
Pemberton, Wigan ... ..	4	3	3	—
Rufford, near Ormskirk ... ..	41	93	77	17
Westhulme, Oldham... ..	4	15	7	6
‡Withnell, near Chorley ... ..	50	82	29	13
Wolstenholme Hall, Norden ... ..	26	61	33	17
TOTAL ... ..	366	694	466	198

\* Closed October 31, 1927, and replaced by the Withnell Hospital.

† Closed October 29, 1927, owing to flooding.

‡ Opened August 15, 1927.

The following table gives particulars of the patients discharged from the various pulmonary hospitals during the year ended 31st December, 1927 :—

TABLE 24.

Classification on Admission to the Institution.	Condition at time of discharge.	Duration of Residential Treatment in the Pulmonary Hospitals.												TOTAL
		Under 3 months.			3—6 months			6—12 months			More than 12 months			
		M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	
T.B. Minus	Quiescent ... ..	3	3	1	2	4	—	—	2	—	—	—	—	15
	Improved ... ..	11	8	2	14	3	—	6	5	—	1	—	—	50
	No material improvement...	7	4	—	2	3	—	2	1	—	—	—	—	19
	Died in Hospital ... ..	6	6	2	3	—	—	—	—	—	—	—	—	17
T.B. Plus 1.	Quiescent ... ..	—	—	—	—	2	—	—	—	—	—	—	—	2
	Improved ... ..	5	2	—	4	1	—	6	3	—	—	—	—	21
	No material improvement...	—	2	—	—	—	—	1	—	—	—	—	—	3
	Died in Hospital ... ..	3	1	—	—	—	—	2	—	—	—	—	—	6
T.B. Plus 2.	Quiescent ... ..	—	1	—	3	3	—	—	2	—	2	1	—	12
	Improved ... ..	18	12	—	23	22	1	30	21	1	5	4	—	137
	No material improvement...	27	18	2	10	8	1	12	3	1	1	2	—	85
	Died in Hospital ... ..	20	25	1	20	11	2	7	4	—	2	—	—	92
T.B. Plus 3.	Quiescent ... ..	—	—	—	1	—	—	—	1	—	—	—	—	2
	Improved ... ..	6	3	—	4	9	—	2	10	—	—	3	—	37
	No material improvement...	19	21	1	9	6	—	5	3	1	—	1	1	67
	Died in Hospital ... ..	36	22	—	6	5	—	6	5	—	1	2	—	83
TOTAL ... ..		161	128	9	101	77	4	79	60	3	12	13	1	648
Observation for purpose of Diagnosis.		Under 1 week.			1—2 weeks.			2—4 weeks.			More than 4 weeks.			
	Tuberculous ... ..	—	—	—	—	—	—	2	—	—	1	1	2	6
	Non-tuberculous ... ..	—	1	—	1	—	—	2	—	—	2	2	—	8
	Doubtful ... ..	—	—	—	—	—	—	1	—	—	1	—	—	2
GRAND TOTAL ... .. 664														

At the pulmonary hospitals the patients with negative sputum are, as far as possible, accommodated in cubicles or wards separate from the patients with positive sputum.



## XVI.—TREATMENT OF NON-PULMONARY TUBERCULOSIS.

IMMEDIATE RESULTS OF INSTITUTIONAL TREATMENT AT  
GENERAL AND SPECIAL HOSPITALS.

A summary of the condition on discharge of patients treated during 1927 in approved general and special hospitals and in the Manchester and Salford Skin Hospital is given below :—

TABLE 25.

Classification on admission to the Institution.	Condition at time of discharge.	Duration of Residential Treatment in the Institution.												TOTAL	
		Under 3 months.			3—6 months			6—12 months			More than 12 months				
		M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	No.	%
Bones and Joints.	Quiescent ... ..	1	4	4	2	3	8	1	1	1	1	1	27	54	26·1
	Improved ... ..	30	22	15	5	6	9	9	1	9	8	4	7	125	60·4
	No material improvement ...	9	4	2	1	—	—	—	—	—	1	—	1	18	8·7
	Died in Institution ... ..	2	—	—	1	—	—	—	1	—	1	2	3	10	4·8
Abdominal.	Quiescent ... ..	3	3	5	1	1	1	—	—	4	—	—	—	18	30·0
	Improved ... ..	7	7	10	—	2	5	1	—	1	—	—	2	35	58·3
	No material improvement ...	—	1	2	—	—	—	—	—	—	—	1	—	4	6·7
	Died in Institution ... ..	—	1	2	—	—	—	—	—	—	—	—	—	3	5·0
Other Organs.	Quiescent ... ..	1	2	—	—	—	1	1	—	—	—	—	1	6	10·9
	Improved ... ..	17	20	7	—	2	1	—	—	—	—	—	—	47	85·4
	No material improvement ...	—	1	1	—	—	—	—	—	—	—	—	—	2	3·6
	Died in Institution ... ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Peripheral Glands.	Quiescent ... ..	2	9	20	1	—	—	—	3	2	—	—	2	39	21·9
	Improved ... ..	21	28	63	2	1	4	—	—	6	—	—	4	129	72·5
	No material improvement ...	1	4	1	1	—	—	—	—	1	—	—	—	8	4·5
	Died in Institution ... ..	—	1	1	—	—	—	—	—	—	—	—	—	2	1·1
	Total ... ..	94	107	133	14	15	29	12	6	24	11	8	47	500	—
		Under 1 week.			1—2 weeks.			2—4 weeks.			More than 4 weeks.				
Observation for purpose of diagnosis.	Tuberculous ... ..	2	—	2	1	2	1	4	3	1	—	4	4	24	66·7
	Non-tuberculous ... ..	—	—	—	—	1	—	1	1	—	2	3	—	8	22·2
	Doubtful ... ..	—	—	—	1	—	1	1	—	—	1	—	—	4	11·1

Grand Total 536

AFTER-HISTORIES.

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In the report for 1926, the after-histories of patients suffering from non-pulmonary tuberculosis who received treatment at special and general hospitals were given. The figures showed that approximately 75 per cent. of the adults and children treated from 1912 to 1925 were cured or fit for work (or school) at the end of 1926. At the end of 1927 these cases showed approximately the same percentage, and the tables of after-histories are consequently not published this year.

With regard to children treated in special hospitals for tuberculosis of the hip, there is the danger, if the after-care of the patients is not given expert attention, that some deformity will develop although the disease may have been quiescent on leaving the hospital. A special enquiry into the after-histories of County patients discharged from a large special hospital after treatment for tuberculosis of the hip shows that of 14 discharges all the patients with the exception of one maintained improvement; thus only 7 per cent. suffered a relapse.

It has been stated that in some areas the proportion of hip cases relapsing is 50 per cent., so that the County figure of 7 per cent. may be regarded as satisfactory and due to the attention given to such cases by the dispensary staff after institutional treatment.

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## XVII.—INSTITUTIONAL ACCOMMODATION.

On the 31st December, 1927, there were altogether 819 beds at sanatoria and hospitals occupied by County patients, as compared with 825 at the end of 1926. The Luneside Pulmonary Hospital, which contained 21 beds, was closed from the 29th October, 1927, owing to flooding.

The number of beds occupied fluctuates considerably during the course of the year: there is a greater demand for beds in the summer than during the winter. For instance, on 1st August, 1928, the number of beds in occupation totalled 904.

Taking the institutional accommodation as it stood on 31st December, 1927, the number of sanatorium beds occupied by pulmonary cases worked out at *one* per 5,608 of the population, and the number of pulmonary hospital beds *one* per 6,475.

Below is given a summary of the beds occupied at the several types of institutions at the end of 1927:—

TABLE 26.

Type of Institution.	Pulmonary Tuberculosis.		Non-Pulmonary Tuberculosis.		Total.
	Adults.	Children.	Adults.	Children.	
(a) Sanatoria... ..	252	3	3	—	258
(b) Children's Sanatoria ...	—	52	—	16	68
(c) Training Colonies ...	9	—	—	—	9
(d) Pulmonary Hospitals ...	270	4	1	—	275
(e) Observation Cases (Pulmonary) ... ..	6	4	—	—	10
(f) General Hospitals ...	3	—	15	6	24
(g) Special Hospitals ...	1	—	58	5	64
(h) Children's Non-Pulmonary Hospitals ... ..	—	2*	—	102	104
(i) Skin Hospital ... ..	—	—	2	2	4
(j) Observation Cases (Non-Pulmonary) ... ..	—	—	3	—	3
Total ... ..	541	65	82	131	819
	606		213		

\* Both "combined" cases — suffering from pulmonary and non-pulmonary tuberculosis.

The number of beds in occupation by County patients on the 31st December of previous years is as follows :—

1921	1922	1923	1924	1925	1926
641	678	750	766	790	825

Of the 606 beds occupied at the end of 1927 by pulmonary patients, 68 per cent. of the cases were classified as "T.B. plus," that is, sometime during treatment their sputum was positive.

The names of the institutions and the number of beds taken by County patients are set out fully in Appendix VI.

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## XVIII.—HOME TREATMENT AND DISPENSARY TREATMENT OR SUPERVISION.

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All notified cases of tuberculosis receive while at home dispensary supervision exercised through the tuberculosis officers and tuberculosis health visitors, in addition to the treatment that may be obtained from their medical practitioners.

For insured persons suffering from tuberculosis, the "National Health Insurance (Medical Benefit) Regulations, 1924," contain references to the duties of practitioners, as to referring and reporting on cases of tuberculosis to the tuberculosis officer, particulars thereof being given in the previous annual report.

The Minister of Health (in Memo. No. 286) advises that an insurance practitioner should refer also to the tuberculosis officer any case suspected to be suffering from tuberculosis in order that there may be no delay in giving the patient the benefit of any facilities available under the tuberculosis scheme of the local authority.

The most cordial and effective co-operation exists in the County between the tuberculosis medical staff and the family doctors.

Ordinary medical treatment at dispensaries (as distinct from special treatment such as artificial light and artificial pneumothorax) has never been undertaken, unless the patient has no doctor or requires some special form of treatment. Patients with active disease are examined by the tuberculosis officer at frequent intervals, and placed for short periods—generally three months—on dispensary supervision, and granted other forms of treatment as found necessary. Quiescent or arrested cases are kept under supervision so long as they are well, and are reviewed annually.

It is highly desirable there should be close co-operation between the medical practitioner or family doctor and the County tuberculosis officer, and, prior to each examination of patients by the latter, information is sent to the medical attendant as to time and place. In some cases general practitioners confer with the tuberculosis officer in person, to their mutual advantage, and in other cases this end is secured by telephone or correspondence. The number of consultations in 1927 was as follows : At the homes of patients, 877 ; otherwise, 4,779 ; total, 5,656.

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## XIX.—TREATMENT AND OCCUPATIONAL TRAINING AND VILLAGE SETTLEMENTS.

Male patients recommended by the tuberculosis officers for a course of treatment combined with training are, by arrangement, sent to the East Lancashire Training Colony, Barrowmore Hall, Cheshire, and occasionally to the British Legion Village, Preston Hall, Aylesford, Kent. The following trades or occupations are taught: poultry farming, pig keeping, game keeping, cabinet making, carpentry, horticulture, market gardening, boot making and repairing, French polishing, and upholstering.

The following table gives particulars of the patients so far granted a course of treatment combined with training:—

TABLE 27.—*Treatment and Occupational Training.*

Classification on Admission.	Total No. admitted (3rd Aug., 1920, to 31st Dec., 1927).	Total Number Dis- charged.	Average duration of stay at Colony* (months).	PATIENTS DISCHARGED.			Still undergoing Training, 31st Dec., 1927.
				Course of Training completed.	Training terminated before completion of course.	Transfer to Sanatoria or Hospital.	
T.B. Minus	33†	29	15·75	13	16	—	4‡
T.B. Plus 1	23	21	16·50	7	12	2	2
T.B. Plus 2	27†	24	15·00	10‡	11‡	3‡	3‡
T.B. Plus 3	3	3	12·00	1	2	—	—
Total	86	77	15·50	31	41	5	9

\* Average duration relates to patients who completed course.

† Includes 4 Civilians.

‡ " 1 "

Thus, of 77 patients who left training colonies (72 of whom were ex-service men), *only* 31 (or 40 per cent.) were regular discharges on completion of the course. The fact that 46 out of 77 men terminated their course prematurely cannot be regarded as satisfactory, particularly as the patients were chosen with extreme care by the tuberculosis officers. The published figures for the whole of the country continue, in my opinion, to be disappointing.



How to deal with tuberculous patients, men and women, following unsuitable occupations, treating them in sanatoria and then training them in some new craft, and eventually settling a proportion of them with unsatisfactory home or working conditions in village settlements, is perhaps the most difficult matter now awaiting a solution on a large scale in the whole tuberculosis problem. The problem is all the more serious owing to the large amount of unemployment among the healthy workers which renders the successful employment of the tuberculous a matter of extreme difficulty. The several village settlements—such as Papworth in Cambridgeshire, and Preston Hall in Kent—established by voluntary bodies in this country are only able to deal with a fraction of the patients, and it is a matter of much controversy at present whether similar successful settlements could be established under schemes administered by public authorities.

Reverting to the Lancashire figures, the reasons given for the 41 patients who left irregularly or prematurely are as follow :—

Medically unfit to continue training...	...	...	...	13	} 41
Temperamentally unsuitable	...	...	...	6	
Discharged for disciplinary reasons	...	...	...	10	
Left on own responsibility and against advice	...	...	...	12	

Concerning the 31 men who duly completed their training, the following statement shows their position at the end of March, 1928 :—

Successfully following occupation in which trained	...	...	...	3	} 31
Following occupation in which trained, but with only partial success	...	...	...	1	
Colonised at East Lancashire Training Colony, Cheshire	...	...	...	6	
Written off Register as Cured	...	...	...	4	
Medically unfit for work	...	...	...	3	
Undergoing treatment in pulmonary or general hospital	...	...	...	2	
Following other occupations	...	...	...	7	
Removed out of County area	...	...	...	4	
Died	...	...	...	1	

In view of the unfortunate lack of success in training men in new occupations and settling them in employment, recommendations for treatment and training are made with the greatest care and stringency ; the number of new admissions in 1927 was 11.

## APPENDIX I.

Death-Rates in 1927 from Tuberculosis in 120 Urban and Rural Districts in Lancashire, and in the 7 County Dispensary Areas.

SANITARY DISTRICTS.	Estimated Population, 1927.	Pulmonary Tuberculosis.			Non-Pulmonary Tuberculosis.	
		Number of Deaths, 1927.	Death-Rate per 1,000 of Population, 1927.	Average Death-Rate 5 years, 1922-26.	Number of Deaths, 1927.	Death-Rate per 1,000 of Population, 1927.
URBAN.						
Abram ... ..	6,631	4	0.60	0.72	2	0.30
Accrington (B) ... ..	43,080	23	0.53	0.72	7	0.16
Adlington ... ..	4,428	2	0.45	0.66	—	—
Ashton-in-Makerfield ... ..	24,620	12	0.48	0.62	3	0.12
Ashton-under-Lyne (B) ... ..	50,850	38	0.74	0.88	5	0.09
Aspull ... ..	7,544	6	0.79	0.57	—	—
Atherton ... ..	20,370	15	0.73	0.63	2	0.09
Audenshaw... ..	8,338	1	0.11	0.57	1	0.11
Bacup (B) ... ..	20,500	15	0.73	0.68	6	0.29
Barrowford... ..	5,659	2	0.35	0.63	1	0.17
Billinge and Winstanley ... ..	5,312	2	0.37	0.68	1	0.18
Blackrod ... ..	3,915	—	—	0.30	—	—
Brierfield ... ..	8,281	7	0.84	0.49	—	—
Carnforth ... ..	3,221	3	0.93	0.48	1	0.31
Chadderton... ..	27,380	23	0.84	0.72	5	0.18
Chorley (B)... ..	31,160	15	0.48	0.59	5	0.16
Church ... ..	6,647	6	0.90	0.69	4	0.60
Clayton-le-Moors ... ..	8,399	3	0.35	0.61	2	0.23
Clitheroe (B) ... ..	11,960	10	0.83	0.61	2	0.16
Colne (B) ... ..	24,960	18	0.72	0.79	6	0.24
Crompton ... ..	14,890	5	0.33	0.83	—	—
Croston ... ..	1,948	1	0.51	0.10	1	0.51
Dalton-in-Furness... ..	11,030	17	1.54	1.13	3	0.27
Darwen (B) ... ..	38,630	13	0.33	0.49	2	0.05
Denton ... ..	17,010	11	0.64	0.71	4	0.23
Droylsden ... ..	13,800	5	0.36	0.87	5	0.36
Eccles (B) ... ..	45,390	42	0.92	0.86	6	0.13
Failsworth ... ..	16,640	12	0.72	0.93	3	0.18
Farnworth ... ..	29,450	22	0.74	0.76	4	0.13
Fleetwood ... ..	23,090	20	0.86	0.81	3	0.12
Formby ... ..	7,419	3	0.40	0.75	—	—
Fulwood ... ..	6,582	2	0.30	0.48	1	0.15
Golborne ... ..	7,512	1	0.13	0.93	5	0.66
Grange-over-Sands ... ..	2,242	2	0.89	0.67	—	—
Great Crosby ... ..	15,410	7	0.45	0.83	3	0.19
Great Harwood ... ..	13,700	7	0.51	0.51	—	—
Haslingden (B) ... ..	17,120	5	0.29	0.66	4	0.23
Haydock ... ..	11,400	2	0.17	0.56	4	0.34
Heysham ... ..	5,743	3	0.52	0.49	—	—
Heywood (B) ... ..	25,550	14	0.54	0.83	5	0.19
Hindley ... ..	24,840	13	0.52	0.76	5	0.20
Horwich ... ..	16,440	19	1.15	0.73	5	0.30
Huyton-with-Roby ... ..	5,255	2	0.38	0.75	1	0.19
Ince-in-Makerfield... ..	24,020	24	0.99	0.68	8	0.33
Irlam ... ..	11,790	10	0.84	0.53	5	0.42
Kearsley ... ..	10,460	8	0.76	0.83	2	0.19
Kirkham ... ..	3,974	4	1.00	0.67	1	0.25
Lancaster (B) ... ..	40,930	36	0.87	0.97	5	0.12
Lathom-and-Burscough ... ..	8,071	3	0.37	0.56	1	0.12
Lees ... ..	4,759	3	0.63	0.66	—	—
Leigh (B) ... ..	46,260	35	0.75	0.87	9	0.19
Leyland ... ..	9,843	6	0.60	0.50	—	—
Litherland ... ..	16,730	18	1.07	1.11	6	0.35
Littleborough ... ..	11,290	3	0.26	0.55	1	0.08
Little Crosby ... ..	1,316	2	1.51	0.17	—	—
Little Hulton ... ..	7,949	7	0.88	0.38	—	—
Little Lever ... ..	5,126	2	0.39	0.43	1	0.19
Longridge ... ..	4,174	3	0.71	0.55	1	0.23
Lytham-St.-Annes (B) ... ..	24,500	13	0.53	0.44	5	0.20
Middleton (B) ... ..	28,910	12	0.41	0.69	4	0.13
Milnrow ... ..	8,704	8	0.91	0.71	2	0.22
Morecambe (B) ... ..	15,240	15	0.98	0.84	—	—
Mossley (B)... ..	11,950	5	0.41	0.80	1	0.08
Nelson (B) ... ..	39,810	16	0.40	0.57	7	0.17
Newton-in-Makerfield ... ..	20,100	14	0.69	0.77	3	0.14



## APPENDIX I (contd.).

SANITARY DISTRICTS.	Estimated Population, 1927.	Pulmonary Tuberculosis.			Non-Pulmonary Tuberculosis.	
		Number of Deaths, 1927.	Death-Rate per 1,000 of Population, 1927.	Average Death-Rate 5 years, 1922-26.	Number of Deaths, 1927.	Death-Rate per 1,000 of Population, 1927.
URBAN (contd.)						
Norden ... ..	4,284	3	0·70	0·42	1	0·23
Ormskirk ... ..	7,646	4	0·52	0·84	2	0·26
Orrell ... ..	7,190	3	0·41	0·70	2	0·27
Oswaldtwistle ... ..	14,910	7	0·46	0·45	3	0·20
Padiham ... ..	12,140	10	0·82	0·74	—	—
Poulton-le-Fylde ... ..	3,007	1	0·33	0·21	—	—
Preesall ... ..	1,948	—	—	1·00	—	—
Prescot ... ..	10,190	5	0·49	0·93	3	0·29
Prestwich ... ..	21,120	16	0·75	0·57	2	0·09
Radcliffe ... ..	25,340	12	0·47	0·59	5	0·19
Rainford ... ..	3,864	—	—	0·21	—	—
Ramsbottom ... ..	14,900	11	0·73	0·59	1	0·06
Rawtenstall (B) ... ..	28,920	14	0·48	0·68	6	0·20
Rishton ... ..	7,014	2	0·28	0·53	2	0·28
Royton ... ..	17,020	5	0·29	0·63	3	0·17
Skelmersdale ... ..	6,936	6	0·86	0·47	1	0·14
Standish-with-Langtree ... ..	7,677	1	0·13	0·57	1	0·13
Stretford ... ..	51,540	34	0·65	0·75	4	0·07
Swinton and Pendlebury ... ..	34,750	24	0·69	0·71	6	0·17
Thornton Cleveleys ... ..	8,053	6	0·74	0·57	—	—
Tottington ... ..	6,529	4	0·61	0·63	1	0·15
Trawden ... ..	2,742	—	—	0·50	—	—
Turton ... ..	12,250	9	0·73	0·48	3	0·24
Tyldesley-with-Shakerley ... ..	15,470	13	0·84	0·73	2	0·12
Ulverston ... ..	9,406	2	0·21	0·72	1	0·10
Upholland ... ..	5,599	1	0·17	0·42	2	0·35
Urmston ... ..	8,201	7	0·85	0·52	4	0·48
Walton-le-Dale ... ..	12,440	7	0·56	0·84	4	0·32
Wardle ... ..	4,639	3	0·64	0·47	2	0·43
Waterloo-with-Seaforth ... ..	31,280	25	0·79	1·00	7	0·22
Westhoughton ... ..	17,670	7	0·39	0·38	2	0·11
Whitefield ... ..	7,588	5	0·65	0·72	1	0·13
Whitworth ... ..	8,555	11	1·28	0·76	2	0·23
Widnes (B) ... ..	42,610	39	0·91	0·92	7	0·16
Withnell ... ..	3,510	—	—	0·56	—	—
Worsley ... ..	14,610	4	0·27	0·50	4	0·27
Total Urban ... ..	1,541,800	981	0·63	0·71	263	0·17
RURAL.						
Barton-upon-Irwell ... ..	11,920	9	0·75	0·83	4	0·33
Blackburn ... ..	10,760	8	0·74	0·58	3	0·27
Burnley ... ..	19,270	7	0·36	0·51	2	0·10
Bury ... ..	9,494	4	0·42	0·74	1	0·10
Chorley ... ..	22,240	6	0·26	0·48	1	0·04
Clitheroe ... ..	8,922	5	0·56	0·61	1	0·11
Fylde ... ..	15,280	5	0·32	0·40	1	0·06
Garstang ... ..	11,230	6	0·53	0·35	1	0·08
Lancaster ... ..	9,283	5	0·53	0·53	2	0·21
Leigh ... ..	11,650	11	0·94	0·49	1	0·08
Limehurst ... ..	8,843	4	0·45	0·79	—	—
Lunesdale ... ..	6,212	3	0·48	0·64	2	0·32
Preston ... ..	26,970	6	0·22	0·52	4	0·14
Sefton ... ..	4,602	4	0·86	0·90	1	0·21
Ulverston ... ..	16,650	15	0·90	0·45	1	0·06
Warrington ... ..	13,520	7	0·51	0·71	1	0·07
West Lancashire ... ..	22,890	10	0·43	0·52	2	0·08
Whiston ... ..	22,450	6	0·26	0·59	3	0·13
Wigan ... ..	6,314	3	0·47	0·37	2	0·31
Total Rural ... ..	258,500	124	0·47	0·55	33	0·12
Total for Administra- tive County... ..	1,800,300	1,105	0·61	0·69	296	0·16
DISPENSARY AREAS.						
No. 1 ... ..	255,076	151	0·58	0·63	38	0·14
No. 2 ... ..	355,674	187	0·52	0·61	61	0·17
No. 3 ... ..	368,383	218	0·59	0·73	55	0·14
No. 4 ... ..	342,606	250	0·72	0·71	56	0·16
No. 5 ... ..	378,948	227	0·59	0·74	76	0·20
Furness Sub-Area ... ..	39,328	36	0·91	0·72	5	0·12
Fylde Sub-Area ... ..	60,285	36	0·65	0·63	5	0·09

## APPENDIX II.

## NOTIFICATIONS OF TUBERCULOSIS.

Since February 1st, 1913, tuberculosis—both “pulmonary” and “other forms”—has been compulsorily notifiable under the Public Health (Tuberculosis) Regulations, 1912. The number of notifications made year by year since 1913 are given on page 6.

Tables B and C, here inserted, analyse the notifications received giving the part of the body affected and the age groups.

Table D, also inserted, compares the male and female notifications.

TABLE 28.—Deaths of 344 persons “notified as suffering from pulmonary tuberculosis” in 1927 which took place within three months of the date of notification.

Period between date of case notification and death.	Certified cause of Death.			Total.
	Pulmonary.		Non- Pulmonary	
	Primary	Secondary		
Under 1 week ... ..	61	6	5	72
1 to 2 weeks ... ..	35	3	4	42
2 to 3 weeks ... ..	34	2	2	38
3 to 4 weeks ... ..	34	2	1	37
1 to 2 months ... ..	88	2	2	92
2 to 3 months ... ..	59	3	1	63
Total under 3 months ...	311	18	15	344
<div>329</div>				

Included in the above Table are 45 deaths which occurred outside the County area.

In addition to the foregoing 344 deaths which occurred within three months of notification, in 27 instances (16 pulmonary and 11 non-pulmonary) death took place *before* the actual receipt of the notification, against 32 (15 pulmonary and 17 non-pulmonary) in the preceding year.



TABLES B, C AND D,  
ANALYSING  
NOTIFICATIONS UNDER PUBLIC HEALTH  
(TUBERCULOSIS)  
REGULATIONS 1912

TABLE B.

ADMINISTRATIVE COUNTY OF LANCASTER.

PUBLIC HEALTH (TUBERCULOSIS) REGULATIONS, 1912—1924.

CORRECTED\* SUMMARY OF NOTIFICATIONS OF PULMONARY AND OTHER FORMS OF TUBERCULOSIS DURING THE FIFTY-TWO WEEKS ENDED 31ST DECEMBER, 1927.

(Collated from Weekly Returns of District Medical Officers of Health.)

NOTIFICATIONS ON FORMS A AND B—Excluding Duplicates.																																		Total Notifi- cations (i.e. including cases previously notified by other Doctors).										
PULMONARY.						NON-PULMONARY.																																						
Lungs only.	Lungs and Larynx.	Larynx.	Bronchial Glands.	Mediastinal Glands.	TOTAL.	JOINTS AND BONES.													ABDOMINAL.			GENITO-URINARY.							PERIPHERAL GLANDS.				MISCELLANEOUS.		TOTAL.	Total Pul- monary and Non- Pul- monary.								
						Head (including Middle Ear).	Trunk.		Arm.					Leg.					Hip and Pelvis.	Femur.	Knee.	Tibia.	Fibula.	Foot and Ankle.	Two or more different Joints.	Not Classified.	Intestines.	Peritoneum.	Mesenteric Glands.	Bladder.	Fall. Tube.	Kidney.					Prostate.	Suprarenal.	Testicle and Epididymis.	Not Classified (2 or more).	MENINGITIS (Brain).	MILIARY (Generalised).	SKIN (Lupus).	Axillary.
Ribs and Sternum.	Spine.	Shoulder.	Scapula.	Humerus.	Elbow.	Radius.	Ulna.	Hand and Wrist.																																				
Thirteen weeks ended 2nd April, 1927 ...	425	7	3	8	6	449	3	2	17	1	...	...	1	...	...	5	14	1	13	...	...	3	3	...	4	32	7	1	...	...	...	...	5	...	18	5	11	2	102	...	6	256	705	794
Thirteen weeks ended 2nd July, 1927 ...	482	7	1	5	1	496	...	4	14	...	...	1	3	...	...	9	9	2	9	...	...	4	8	...	3	42	9	...	...	3	...	...	6	1	21	...	13	1	147	1	11	321	817	903
Thirteen weeks ended 1st October, 1927 ...	438	6	2	3	2	451	3	3	8	1	1	1	2	...	...	2	21	...	5	...	...	6	1	...	4	35	7	...	...	2	...	...	7	...	18	2	13	3	104	...	10	259	710	799
Thirteen weeks ended 31st December, 1927	388	6	3	...	1	398	...	3	20	...	...	...	...	1	...	3	7	5	8	...	...	1	2	1	5	31	4	...	...	1	...	1	1	...	16	2	15	...	75	...	7	209	607	688
Total ...	1733	26	9	16	10	*1794	6	12	59	2	1	2	6	1	...	19	51	8	35	...	...	14	14	1	16	140	27	1	...	6	...	1	19	1	73	9	52	6	428	1	34	*1045	*2839	3184

NOTIFICATIONS ON FORMS A AND B—Excluding Duplicates.																									NOTIFICATIONS. FORM B ONLY. (By School Medical Inspectors).												Number of Cases Notified on Form C. (Admissions).		Number of Cases notified on Form D (Dis- charges from Institu- tions).							
PULMONARY.														NON-PULMONARY.											Total Pul- monary and Non-Pul- monary.	PRIMARY NOTIFICATIONS. (i.e., excluding duplicates).				Total Notifica- tions (i.e., including cases previously notified by other Doctors).	Poor Law Institu- tions.	Sana- toria.														
Years.	{	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and up- wds.	TOTAL.	TOTAL M. & F.	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65		65 and up- wds.	TOTAL.	TOTAL M. & F.	Under 5 years.				5 to 10 years.	10 to 15 years.	TOTAL.											
Thirteen weeks ended 2nd April, 1927 ... {	M. F.	...	4 7	15 10	15 14	30 37	25 26	42 55	48 27	41 21	21 7	3 1	244 205	}	449	3 4	29 22	33 20	27 22	17 18	6 10	8 15	5 6	2 3	...	3 1	133 123	}	256	705	P. ...	N.P. ...	P. ...	N.P. ...	P. ...	N.P. ...	P. ...	N.P. ...	6 4	}	11	11	3	300	297	
Thirteen weeks ended 2nd July, 1927 ... {	M. F.	...	5 2	11 12	7 11	34 44	32 40	62 48	46 39	42 17	20 15	4 5	263 233	}	496	4 5	26 24	44 28	23 26	17 18	16 20	8 18	3 13	8 7	4 4	1 4	154 167	}	321	817	...	...	...	...	...	1 ...	...	...	1 2	}	3	3	16	306	266	
Thirteen weeks ended 1st October, 1927 ... {	M. F.	...	2 2	15 10	7 15	24 29	24 35	47 45	52 29	55 19	22 12	4 3	252 199	}	451	4 2	21 21	25 25	25 18	19 15	9 6	16 22	6 7	2 9	...	1 5	1 1	128 131	}	259	710	...	...	...	...	2 6	1 1	3 2	1 1	5 8	}	15	17	9	343	312
Thirteen weeks ended 31st December, 1927 ... {	M. F.	1 ...	...	6 5	10 9	27 19	30 27	46 47	41 18	47 14	22 17	8 2	238 160	}	398	1 4	25 17	29 22	12 15	13 10	7 11	8 20	4 7	1 1	...	2 ...	102 107	}	209	607	...	1 ...	...	...	2 3	...	1 2	...	4 5	}	10	13	5	314	285	
Total ... {	M. F.	1 ...	11 13	47 37	39 49	115 129	111 128	197 195	187 113	185 71	85 51	19 11	997 797	}	*1794	12 15	101 84	131 95	87 81	66 61	38 47	40 75	18 33	13 20	4 11	7 6	517 528	}	*1045	*2839	...	1 1	1 ...	9 14	1 2	6 4	2 2	16 19	}	39	44	33	1263	1160		

\*Corrected figures after deducting 68 Pulmonary and 51 Non-Pulmonary cases notified in error.



TABLE C.

## ADMINISTRATIVE COUNTY OF LANCASTER.

PUBLIC HEALTH (TUBERCULOSIS) REGULATIONS, 1912—1924.

ANALYSIS OF THE NOTIFICATIONS ON FORMS A AND B (EXCLUDING DUPLICATES) RECEIVED DURING THE FIFTY-TWO WEEKS  
ENDED 31st DECEMBER, 1927. († Corrected figures.)

(Collated from Weekly Returns of District Medical Officers of Health.)

AGE—YEARS :—		...	0 — 1			1 — 5			5 — 10			10 — 15			15 — 20			20 — 25			25 — 35			35 — 45			45 — 55			55 — 65			65 & upwds.			TOTALS.			...		
SEX.		Col.	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	Col.		
PULMONARY—																																									
Lungs only ...	...	1	1	...	1	11	11	22	36	34	70	36	46	82	113	125	238	109	126	235	190	191	381	178	112	290	181	68	249	84	51	135	19	11	30	958	775	1733	1		
Lungs and Larynx...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2	2	...	2	6	3	9	6	1	7	4	2	6	...	...	...	...	...	...	19	7	26	2		
Larynx ...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	1	1	...	1	3	...	3	...	...	...	1	...	...	...	...	...	5	4	9	3		
Bronchial Glands	...	4	...	...	...	...	1	1	7	3	10	2	1	3	1	...	1	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	10	6	16	4		
Mediastinal Glands	...	5	...	...	...	...	1	1	4	...	4	1	1	2	...	1	1	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	5	5	10	5			
PULMONARY TOTAL	...	6	1	...	1	11	13	24	47	37	84	39	49	88	115	129	244	111	128	239	197	195	392	187	113	300	185	71	256	85	51	136	19	11	30	997	797	1794	6		
*Cases—Pulmonary and Non-Pulmonary combined	...		...	...	...	3	2	5	2	1	3	3	4	7	9	2	11	6	3	9	5	8	13	4	1	5	4	2	6	2	...	2	...	...	...	38	23	61			
NON-PULMONARY—																																									
JOINTS AND BONES	Head ... (Incl. Middle Ear)	7	1	3	4	...	...	...	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	5	6	7		
	Trunk—																																								
	Ribs and Sternum	8	...	...	...	...	...	...	...	...	...	...	...	...	...	3	3	2	...	2	...	2	...	1	1	...	1	1	...	...	...	3	...	3	5	7	12	8			
	Spine	9	1	...	1	6	4	10	6	3	9	5	2	7	6	5	11	4	5	9	2	1	3	3	2	5	1	1	2	2	...	2	...	...	...	36	23	59	9		
	Arm—																																								
	Shoulder	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	1	...	1	1	1	2	10		
	Scapula	11	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	11		
	Humerus	12	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	12			
	Elbow	13	...	...	...	...	...	...	...	...	1	1	...	...	...	...	2	2	1	...	1	...	...	...	1	...	1	...	...	...	...	...	...	...	3	3	6	13			
	Radius	14	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	14		
	Ulna	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15		
	Hand and Wrist	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12	7	19	16
	Leg—																																								
	Hip and Pelvis	17	...	...	...	...	1	1	2	8	3	11	10	2	12	7	4	11	1	3	4	3	3	6	1	...	1	1	1	2	...	2	2	...	...	...	32	19	51	17	
	Femur	18	...	...	...	...	...	1	1	3	...	3	...	...	...	2	1	3	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	5	3	8	18		
	Knee	19	...	...	...	...	3	3	6	5	4	9	3	3	6	2	1	3	2	...	2	...	5	7	...	...	...	1	...	1	...	1	1	...	...	...	18	17	35	19	
Tibia	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20		
Fibula	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	21		
Foot and Ankle	22	...	...	...	...	1	2	3	1	1	2	2	...	2	3	...	3	3	...	3	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	11	3	14	22	
Two or more different Joints	23	1	...	1	1	...	1	2	1	3	1	...	1	1	1	1	2	1	...	1	3	...	3	...	...	1	...	1	...	1	1	...	...	...	11	3	14	23			
Not Classified	24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	24		
ABDOMINAL																																									





TABLE D.

## ADMINISTRATIVE COUNTY OF LANCASTER.

## PUBLIC HEALTH (TUBERCULOSIS) REGULATIONS, 1912—1924.

THE FOLLOWING TABLE COMPARES THE MALE AND FEMALE NOTIFIED CASES IN THE ADMINISTRATIVE COUNTY DURING THE YEARS 1913 to 1927, AT CERTAIN AGE GROUPS:—

PULMONARY TUBERCULOSIS.																NON-PULMONARY TUBERCULOSIS.													
			Cases Male or Fe- male.	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and up- wds.	Total.	Total.* M. & F.	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and up- wds.	Total.	Total.* M. & F.
1913	...	...	M	1	24	97	70	129	131	311	292	228	114	29	1426	2700	29	128	177	137	98	58	71	48	27	18	3	794	1592
(11 months)			F	6	28	100	104	158	188	296	201	103	65	25	1274		28	118	134	132	118	86	80	47	29	19	7	798	
1914	...	...	M	6	40	80	83	112	172	329	315	240	107	23	1507	2820	43	111	131	95	77	36	47	23	20	14	3	600	1140
			F	3	32	115	107	140	181	336	225	107	47	20	1313		37	88	98	89	77	44	58	27	12	6	4	540	
1915	...	...	M	5	47	97	79	127	138	305	303	235	117	34	1487	2872	39	109	113	93	61	46	50	29	14	5	3	562	1128
			F	5	27	96	111	152	191	383	239	100	60	21	1385		26	88	107	88	84	53	61	33	15	7	4	566	
1916	...	...	M	1	31	71	77	121	157	331	296	190	96	36	1407	2689	20	127	135	99	65	42	47	34	12	13	5	599	1180
			F	2	24	81	96	165	186	345	220	98	52	13	1282		8	68	122	114	85	46	65	41	19	11	2	581	
1917	...	...	M	4	20	77	62	113	104	262	268	190	90	30	1220	2375	21	116	109	105	61	23	42	30	8	9	1	525	1062
			F	2	22	90	100	129	155	296	185	107	50	19	1155		7	79	97	98	89	59	49	25	23	6	5	537	
1918	...	...	M	3	35	55	59	140	108	300	317	232	98	28	1375	2534	14	75	103	65	60	19	29	16	14	7	2	404	885
			F	1	24	69	74	139	166	297	207	117	52	13	1159		10	75	84	92	80	46	46	29	9	6	4	481	
1919	...	...	M	2	22	53	55	94	107	238	212	165	91	17	1056	2105	13	50	97	80	53	26	31	22	19	12	4	407	847
			F	5	14	54	80	126	161	261	184	99	41	24	1049		10	59	98	76	61	43	41	29	11	7	5	440	
1920	...	...	M	2	24	56	63	94	120	281	249	160	90	14	1153	2084	31	62	107	108	68	26	35	23	16	11	5	492	968
			F	2	20	53	71	115	122	264	147	84	36	17	931		12	66	86	78	62	46	52	34	23	16	1	476	
1921	...	...	M	1	17	43	47	94	133	222	225	162	84	19	1047	2044	12	60	110	84	53	32	41	23	17	6	4	442	899
			F	...	12	53	77	132	160	255	156	82	50	20	997		15	62	89	81	65	41	53	15	21	9	6	457	
1922	...	...	M	3	16	38	47	83	120	227	190	148	99	27	998	1863	18	101	111	79	55	37	39	22	13	7	3	485	956
			F	4	15	45	57	135	135	202	146	61	42	23	865		13	77	80	95	61	45	50	24	14	7	5	471	
1923	...	...	M	2	10	41	43	82	132	236	207	147	94	13	1007	1937	18	115	134	105	75	35	45	22	14	15	6	584	1188
			F	1	14	43	60	115	149	251	149	83	49	16	930		14	103	110	107	68	60	64	31	28	14	5	604	
1924	...	...	M	...	27	37	52	105	110	203	199	197	97	18	1045	1972	19	123	92	92	95	35	43	25	17	12	3	556	1120
			F	3	12	29	55	144	139	223	169	94	49	10	927		6	99	87	94	80	55	72	30	17	11	13	564	
1925	...	...	M	...	22	32	38	81	115	212	200	192	74	24	990	1846	17	108	106	73	58	37	53	26	15	12	5	510	1027
			F	3	10	24	44	144	153	198	136	85	34	25	856		9	86	84	91	82	41	57	33	18	10	6	517	
1926	...	...	M	1	9	27	40	91	113	210	198	158	110	23	980	1828	10	90	97	76	75	29	35	32	16	7	3	470	953
			F	2	12	41	47	114	169	224	120	68	38	13	848		19	83	94	51	67	56	51	34	17	6	5	483	
1927	...	...	M	1	11	47	39	115	111	197	187	185	85	19	997	1794	12	101	131	87	66	38	40	18	13	4	7	517	1045
			F	...	13	37	49	129	128	195	113	71	51	11	797		15	84	95	81	61	47	75	33	20	11	6	528	

\* Corrected figures from 1922 after deducting the following cases found to be non-tuberculosis and notifications cancelled:—1922: 14 pulmonary, 12 non-pulmonary; 1923: 33 pulmonary, 31 non-pulmonary; 1924, 57 pulmonary, 38 non-pulmonary; 1925: 83 pulmonary, 49 non-pulmonary; 1926: 61 pulmonary, 41 non-pulmonary; and 1927: 68 pulmonary, 51 non-pulmonary.





TABLE 29.—*Actual number of deaths from pulmonary and non-pulmonary tuberculosis since 1918 not previously notified under the Public Health (Tuberculosis) Regulations :—*

No. of Non-notified Fatal Cases of—	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
Pulmonary Tuberculosis (Consumption) ...	303	221	177	135	105	85	64	67	58	54
Non-Pulmonary Tuberculosis ...	137	104	122	96	83	74	65	57	32	42
Total ...	440	325	299	231	188	159	129	124	90	96

The 96 deaths in 1927 of cases not previously notified under the Regulations are further analysed below :—

TABLE 30.

	Cause of Death.			Total.
	Pulmonary.		Non-Pulmonary	
	Primary	Secondary		
No. of deaths of persons at private addresses ...	38	7	32	77
No. in County Mental Hospitals of persons belonging to County area ...	1	1	—	2
No. in Union Institutions of persons belonging to County area ...	4	1	8	13
No. in other public institutions of persons belonging to County area ...	1	1	2	4
	44	10		
	54		42	96

During 1927, 110 pulmonary and 67 non-pulmonary deaths occurred outside the County area of persons usually residing in the Administrative County. Of these, 104 pulmonary and 62 non-pulmonary occurred in public institutions. In 68 instances no case notification could be traced. These are not included in Table 30.

N.B.—The Tables mentioned in Appendix II have been prepared in the County Public Health Department.

## APPENDIX III.

Return showing the work of the Dispensaries during the year 1927.  
(Table I. of Memorandum 37/T of Ministry of Health).

DIAGNOSIS.	PULMONARY.				NON-PULMONARY.				TOTAL.			
	Adults.		Children.		Adults.		Children.		Adults.		Children.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
A.—NEW CASES examined during the year (excluding contacts):												
(a) Definitely tuberculous ...	728	513	58	58	168	224	247	205	896	737	305	263
(b) Doubtfully tuberculous...	—	—	—	—	—	—	—	—	111	95	69	57
(c) Non-tuberculous... ..	—	—	—	—	—	—	—	—	719	631	350	312
B.—CONTACTS examined during the year:												
(a) Definitely tuberculous ...	16	18	16	16	1	5	14	16	17	23	30	32
(b) Doubtfully tuberculous...	—	—	—	—	—	—	—	—	7	15	17	13
(c) Non-tuberculous ...	—	—	—	—	—	—	—	—	143	211	176	214
C.—CASES written off the Dispensary Register as:												
(a) Cured ... ..	217	205	10	12	165	181	86	99	382	386	96	111
(b) Diagnosis not confirmed or non-tuberculous (including cancellation of cases notified in error)... ..	—	—	—	—	—	—	—	—	916	886	558	563
D.—NUMBER OF PERSONS on Dispensary Register on December 31st, 1927:												
(a) Diagnosis completed ...	2456	1924	267	271	871	1068	808	680	3327	2992	1075	951
(b) Diagnosis not completed	—	—	—	—	—	—	—	—	13	25	12	13

1. Number of persons on Dispensary Register on January 1st, 1927 ...	8866	9. Number of patients to whom Dental Treatment was given, at or in connection with the Dispensary ...	34*
2. Number of patients transferred from other areas and of "lost sight of" cases returned ... ..	132	10. Number of consultations with medical practitioners:—	
3. Number of patients transferred to other areas and cases "lost sight of" including patients not desiring or requiring Public Medical Treatment ...	972	(a) At Homes of Applicants ...	877
4. Died during the year.... ..	1163	(b) Otherwise ... ..	4779
5. Number of observation cases under A (b) and B (b) above, in which period of observation exceeded 2 months... ..	59	11. Number of other visits by Tuberculosis Officers to Homes ...	5125
6. Number of attendances at the Dispensary (including Contacts) ...	23900	12. Number of visits by Nurses or Health Visitors to Homes for Dispensary purposes ... ..	46508
7. Number of attendances of non-pulmonary cases at Orthopædic Outstations for treatment or supervision	1346	13. Number of	
8. Number of attendances, at General Hospitals or other Institutions approved for the purpose, of patients for	At County Dispensaries 14322 At Hospitals 3036	(a) Specimens of sputum, &c., examined ... ..	5473
(a) "Light" treatment ... ..	17358	(b) X-ray examinations made in connection with Dispensary work ... ..	5239
(b) Other special forms of treatment	2531	14. Number of Insured Persons on Dispensary Register on the 31st December ... ..	4438
		15. Number of Insured Persons under Domiciliary Treatment on the 31st December ... ..	1474
		16. Number of reports received during the year in respect of Insured Persons:—	
		(a) Form G.P. 17 ... ..	44
		(b) Form G.P. 36 ... ..	128

16 cases previously written off the register as cured have returned to treatment.

\* In addition, 328 individual patients received dental attention whilst undergoing treatment at sanatoria or hospitals.



## APPENDIX IV.

## RESIDENTIAL INSTITUTIONS.

(A) AVERAGE NUMBER OF BEDS AVAILABLE FOR PATIENTS DURING  
THE YEAR 1927.

(Table II. of Memorandum 37/T of Ministry of Health).

	Observation.	Pulmonary Tuberculosis.		Non-Pulmonary Tuberculosis.		Total.
		"Sanatorium" Beds.	"Hospital" Beds.	Disease of Bones and Joints.	Other Conditions.	
Adult Males ... ..	4	172	157	38	9	380
Adult Females ... ..	6	127	105	25	9	272
Children under 15 ... ..	4	58	7	99	34	202
TOTAL ... ..	14	357	269	162	52	854

(B) RETURN SHOWING THE EXTENT OF RESIDENTIAL TREATMENT  
DURING THE YEAR 1927.

			In Institutions on Jan. 1.	Admitted during the year.	Discharged during the year.	Died in the Institutions.	In Institutions on Dec. 31.
Number of Patients ...	Adults	M.	342	905	732	136	379
		F.	271	657	593	98	237
	Children	M.	114	198	189	7	116
		F.	87	142	148	7	74
Number of Observation Cases ... ..	Adults	M.	4	39	40	—	3
		F.	2	44	42	—	4
	Children	M.	—	7	6	—	1
		F.	5	15	15	—	5
	Total...		825	2007	1765	248	819

## APPENDIX V.

Return showing the immediate results of treatment of patients and of observation of doubtful cases discharged from Residential Institutions during the year 1927.

(Table III. of Memorandum 37/T of Ministry of Health).

Classification on admission to the Institution .	Condition at time of discharge.	Duration of Residential Treatment in the Institution.													TOTAL
		Under 3 months.			3—6 months			6—12 months			More than 12 months				
		M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.		
PULMONARY TUBERCULOSIS.	Class T.B. minus.	Quiescent ... ..	30	27	8	28	41	20	11	12	5	3	1	2	188
		Improved ... ..	27	19	7	30	13	16	18	8	19	1	1	8	167
		No material improvement...	15	17	1	3	5	1	3	2	1	—	—	—	48
		Died in Institution ... ..	8	7	4	6	2	1	—	—	—	1	—	—	29
	Class T.B. plus Group 1.	Quiescent ... ..	4	3	1	3	7	—	2	4	—	1	3	—	28
		Improved ... ..	20	6	—	31	9	—	22	8	—	4	3	3	106
		No material improvement...	6	4	—	5	2	1	4	1	—	1	2	1	27
		Died in Institution ... ..	4	1	—	—	—	—	2	1	—	—	—	—	8
	Class T.B. plus Group 2.	Quiescent ... ..	4	3	—	9	4	2	5	7	1	2	2	—	39
		Improved ... ..	48	21	1	57	42	1	55	43	1	7	13	—	289
		No material improvement...	38	34	3	23	17	1	22	7	1	3	3	1	153
		Died in Institution ... ..	22	29	1	27	11	2	7	5	—	2	—	—	106
	Class T.B. plus Group 3.	Quiescent ... ..	—	—	—	1	—	—	—	2	—	—	—	—	3
		Improved ... ..	7	6	—	7	10	—	4	11	—	—	3	—	48
		No material improvement	21	23	1	14	7	1	6	5	1	—	1	1	81
		Died in Institution ... ..	38	22	—	8	6	—	6	6	—	1	3	—	90
	Bones & Joints.	Quiescent or Arrested ... ..	1	4	4	2	3	8	1	1	1	1	1	27	54
		Improved ... ..	30	22	15	5	6	9	9	1	9	8	4	7	125
		No material improvement...	9	4	2	1	—	—	—	—	—	1	—	1	18
		Died in Institution...	2	—	—	1	—	—	—	1	—	1	2	3	10
	Abdominal.	Quiescent or Arrested ... ..	3	3	5	1	1	1	—	—	4	—	—	—	18
		Improved ... ..	7	7	10	—	2	5	1	—	1	—	—	2	35
		No material improvement...	—	1	2	—	—	—	—	—	—	—	1	—	4
		Died in Institution ... ..	—	1	2	—	—	—	—	—	—	—	—	—	3
	Other Organs.	Quiescent or Arrested ... ..	1	2	—	—	—	1	1	—	—	—	—	1	6
		Improved ... ..	17	20	7	—	2	1	—	—	—	—	—	—	47
		No material improvement...	—	1	1	—	—	—	—	—	—	—	—	—	2
		Died in Institution...	—	—	—	—	—	—	—	—	—	—	—	—	—
	Peripheral Glands.	Quiescent or Arrested ... ..	2	9	20	1	—	—	—	3	2	—	—	2	39
		Improved ... ..	21	28	63	2	1	4	—	—	6	—	—	4	129
		No material improvement...	1	4	1	1	—	—	—	—	1	—	—	—	8
		Died in Institution ... ..	—	1	1	—	—	—	—	—	—	—	—	—	2
Observation for purpose of Diagnosis.		Under. 1 week			1—2 weeks.			2—4 weeks.			More than 4 weeks.				
	Tuberculous ... ..	2	—	2	1	2	1	6	6	2	8	11	9	50	
	Non-tuberculous ... ..	—	1	—	1	1	—	6	3	—	10	18	5	45	
	Doubtful ... ..	—	—	—	1	—	1	3	—	—	2	—	1	8	



## APPENDIX VI.

## INSTITUTIONAL ACCOMMODATION.

The following table shows the number of beds occupied by County patients undergoing residential treatment for pulmonary and non-pulmonary tuberculosis on the 31st December, 1927 :—

Institution.	Pulmonary Tuberculosis.		Non-Pulmonary Tuberculosis.		Total.
	Adults.	Children.	Adults.	Children.	
<i>(a) Sanatoria.</i>					
Aitken, near Bury ... ..	45	—	—	—	45
Blencathra, Cumberland ... ..	1	—	—	—	1
Crossley, Cheshire .. ...	1	—	—	—	1
East Lancashire, Cheshire ... ..	36	—	—	—	36
Elswick, near Kirkham ... ..	39	—	—	—	39
Frimley, Surrey ... ..	1	—	—	—	1
Halifax (Shelf) ... ..	9	—	—	—	9
High Carley, near Ulverston ... ..	72	3	2	—	77
King Edward VII, Sussex ... ..	3	—	—	—	3
King George V., Hants (for sailors) ... ..	—	—	1	—	1
Meathop, Grange-over-Sands ... ..	29	—	—	—	29
Rufford, near Ormskirk... ..	4	—	—	—	4
Ventnor, Isle of Wight ... ..	1	—	—	—	1
Wilkinson, Bolton ... ..	11	—	—	—	11
Total ... ..	252	3	3	—	258
<i>(b) Children's Sanatoria.</i>					
Eastby, near Skipton ... ..	—	84	—	14	48
Oubas House, near Ulverston ... ..	—	18	—	2	20
Total ... ..	—	52	—	16	68
<i>(c) Training Colonies.</i>					
East Lancashire, Cheshire ... ..	5	—	—	—	5
Preston Hall, Kent ... ..	4	—	—	—	4
Total ... ..	9	—	—	—	9
<i>(d) Pulmonary Hospitals.</i>					
Burnley ... ..	9	—	—	—	9
Chadderton, near Oldham ... ..	37	2	—	—	39
East Lancashire, Cheshire ... ..	11	—	—	—	11
Eccleston Hall, St. Helens ... ..	5	—	1	—	6
Heath Charnock, Chorley ... ..	28	—	—	—	28
Hefferston Grange, Cheshire ... ..	5	—	—	—	5
Marland, Rochdale ... ..	4	—	—	—	4
Peel Hall, Little Hulton ... ..	47	—	—	—	47
Pemberton, Wigan ... ..	4	—	—	—	4
Rufford, near Ormskirk... ..	36	2	—	—	88
Westhulme, Oldham ... ..	6	—	—	—	6
Withnell, near Chorley ... ..	48	—	—	—	48
Wolstenholme Hall, Norden ... ..	30	—	—	—	30
Total ... ..	270	4	1	—	275
<i>(e) Observation Cases (Pulmonary).</i>					
Chadderton Pulmonary Hospital ... ..	1	—	—	—	1
Eastby Sanatorium ... ..	—	1	—	—	1
Heath Charnock Pulmonary Hospital ... ..	—	1	—	—	1
High Carley Sanatorium ... ..	3	—	—	—	3
Liverpool David Lewis Northern Hospital ... ..	1	—	—	—	1
Oubas House Sanatorium ... ..	—	1	—	—	1
Rufford Pulmonary Hospital ... ..	1	1	—	—	2
Total ... ..	6	4	—	—	10

# APPENDIX VI. INSTITUTIONAL ACCOMMODATION (contd.).

Institution.	Pulmonary Tuberculosis.		Non-Pulmonary Tuberculosis.		Total.
	Adults.	Children.	Adults.	Children.	
<i>(f) General Hospitals.</i>					
Ashton-under-Lyne Infirmary ... ..	—	—	4	1	5
Burnley Victoria Hospital ... ..	1	—	—	—	1
Liverpool David Lewis Northern Hospital ... ..	—	—	1	—	1
Liverpool Royal Infirmary ... ..	—	—	8	—	3
Manchester Royal Infirmary ... ..	—	—	5	2	7
Preston Royal Infirmary ... ..	2	—	1	2	5
Warrington Infirmary ... ..	—	—	1	—	1
Wigan Infirmary ... ..	—	—	—	1	1
Total ... ..	3	—	15	6	24
<i>(g) Special Hospitals.</i>					
Elswick, near Kirkham ... ..	1	—	21	3	25
Rufford, near Ormskirk... ..	—	—	6	—	6
Shropshire Orthopædic, Oswestry ...	—	—	31	2	33
Total ... ..	1	—	58	5	64
<i>(h) Children's Non-Pulmonary Hospitals.</i>					
Alton, Hants (Lord Mayor Treloar Cripples' Hospital)... ..	—	—	—	22	22
Heatherwood, Berks (United Services Fund) ... ..	—	—	—	17	17
Leasowe (Liverpool Open-air Hospital for Children) ... ..	—	1	—	29	30
Pendlebury (Royal Manchester Children's Hospital) ... ..	—	—	—	1	1
Royal Liverpool Children's Hospital:— Myrtle Street, Liverpool ... ..	—	—	—	1	1
Heswall, Cheshire ... ..	—	—	—	11	11
Thingwall, Cheshire ... ..	—	—	—	2	2
Sheffield (King Edward VII Hospital for Crippled Children) ... ..	—	—	—	12	12
West Kirby (Children's Convalescent Home) ... ..	—	1	—	7	8
Total ... ..	—	2	—	102	104
<i>(i) Skin Hospital.</i>					
Manchester and Salford... ..	—	—	2	2	4
<i>(j) Observation Cases (Non-Pulmonary).</i>					
Manchester Royal Infirmary ... ..	—	—	3	—	3
GRAND TOTAL ... ..	541	65	82	131	819
	606		213		